U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

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Awards Register Grants Assistance Programs. Volume I

Environmental Protection Agency

April 1976

EPA GAD/1-76-001

PB-252 863

AWARDS REGISTER
GRANTS ASSISTANCE PROGRAMS

Volume I

Listing Awards During the 1ST HALF OF FY 1976
Except State and Local Assistance Awards

U.S. ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

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4. Title and Subtitle
Awards Listing
Grants Assistance Programs of EPA
1st Half FY '76 Vol. I; except State & Local Assistance

5. Report Date
April 1976

6.

7.
Julius Jay Sabo & Ellen O'Boyle

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Grants Administration Division
Office of Administration
U.S. Environmental Protection Agency
Washington, D.C. 20460

10. Project/Task/Work Unit No.

11. Contract/Grant No.

12. Sponsoring Organization Name and Address
same as item 9

13. Type of Report & Period Covered
1st half of FY '76

14.

15. Supplementary Notes
This is an addition to the series of Awards Listings

16. Abstracts

This publication lists all the First Half of Fiscal Year 1976 Awards by the United States Environmental Protection Agency except State & Local Assistance.

A 250 word description of each research and demonstration project is contained in Section two by grant number in ascending order. Section three contains an index of all awards arranged by subject content according to the fourteen sub-programs classification of our Office of Research and Development.

17. Key Words and Document Analysis. 17a. Descriptors

Water
Awards
Air
Solid Waste
Hazardous Material
Pesticides
Grants
Radiation
Water Supply
Training
Fellowships

17b. Identifiers/Open-Ended Terms

EPA Awards for headquarters grants programs

PRICES SUBJECT TO CHANGE

17c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages
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ATTENTION

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PREFACE

This "Awards Listing" consists of two volumes. Volume I lists all grants awards except State and local assistance which includes Wastewater Treatment Construction grants. Volume II lists only State and local assistance awards.

Volume I consists of three sections. Section one is the awards listing with the first sort by States, then media such as air, water, pesticide, etc. Section two is organized on the basis of grant numbers in ascending order. Following the grant number there is a brief description of project to be performed. This description was prepared by the grantees and contains approximately 250 words. This arrangement was first tried in our "Awards Register - 2nd Half of FY 1975" and found to be very useful both from the grants management aspect as well as fulfilling the public information requirements.

Section three contains the tabulation of grants by the fourteen sub-program areas identified by the Office of Research and Development in the publication "Report to Congress; Environmental Research Outlook, FY 1976 - 1980".

A few awards do not have a description and there may be ommissions, but due to the desire on our part to publish as soon as possible after the close of the fiscal year, we decided to follow this course of action rather than delaying the publication for further refinement. Any comments or criticisms should be mailed or phoned to Ellen O'Boyle or Julius Jay Sabo, Grants Information Office on (202) 755-2830.

Grants Administration Division

SOURCES OF INFORMATION ON EPA GRANTS AWARDED, REPORTS GENERATED BY GRANTS AND OTHER GRANTS RELATED MATERIALS

Awards Register, Grants Assistance Programs of EPA; 1st Half Fiscal Year 1976

Volume I. Lists all awards in research demonstration, training and fellowship in Section I. Section II contains a 250 word description of most research and demonstration project. Section III provides an index of all awards arranged by subject content according to the fourteen sub-program classification of our Office of Research and Development. Environmental Protection Agency, EPA-GAD/1-76-001, NTIS number not, as yet, available.

Volume II Lists all State and Local Assistance Awards.

Environmental Protection Agency, EPA-GAD/1-76-002, NTIS order number not, as yet, available.

Awards Register, Grants Assistance Programs of EPA; During 2nd Half of Fiscal Year 1975.

Volume I. Lists all awards in research demonstration, training and fellowship in Section I. Section II contains a 250 word description of most research and demonstration project. Environmental Protection Agency, EPA-GAD/1 75-003. Price $8.50 Paper, $2.25 microfiche, NTIS order no. PB 245 575

Volume II Lists all State and Local Assistance Awards.

Environmental Protection Agency, EPA-GAD/1-75-004 Price $9.25 Paper, $2.25 microfiche, NTIS order no. PB 245 576

Semi Annual Award Listing, Grants Assistance Programs of EPA; Awards During 1st Half of Fiscal Year 1975

Volume I Lists all awards in research, demonstration, training and fellowship

Environmental Protection Agency, EPA-GAD/1-75-001 available from NTIS, publication no. PB 241 476 $4.25 Paper, $2.25 microfiche.

Volume II Lists all State and Local Assistance Awards

Environmental Protection Agency, EPA-GAD/1-75-002 available from NTIS, publication no. PB 241 400/ as $7.00 Paper, $2.25 microfiche.

Awards Register-Grants Assistance Programs-Showing Projects Awarded in Fiscal Year 1974

Volume I Lists all awards in Fiscal Year 1974 Except Waste Water Treatment Construction and Waste Water Treatment Reimbursement Awards. Contains 168 pages

NTIS order no. PB 238 370/AS
$6.25 Paper copy and $2.25 microfiche

Volume II Lists only Waste Water Treatment Construction
Awards in Fiscal Year 1974

NTIS order no. PB 238 371/AS
$7.25 Paper copy and $2.25 microfiche

Volume III Lists only Wastewater Treatment Reimbursement
Awards in Fiscal Year 1974

NTIS order no. PB 238 372/AS
$7.00 Paper copy and $2.25 microfiche

Awards Register-Grants Assistance Program-Showing Projects
Awarded in Fiscal Year 1973, EPA 220/
1-73-004, NTIS order no. PB 229 827/AS
$10.00 Paper copy, $1.45 microfiche

The format of the above publications has the initial sort by States. Each entry includes grantee indentification, program area (such as water, air) grant title, grant number, award date and dollar amount.

The public can purchase the above from the:

National Technical Information Service (NTIS)
Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22151
(703) 321-8507

THE AWARDS REGISTER, GRANTS ASSISTANCE PROGRAMS (EPA) SHOWING PROJECTS AWARD IN FISCAL YEAR 1972

This publication can be purchased from the Superintendent of Documents, U. S. Government Printing Office (GPO), Washington, D.C. 20402. This document can be ordered for $3.70 by mail delivery and $3.25 if picked up at GPO. When ordering, specify Stock Number 5500-00084. For materials ordered from the Government Printing Office, address request and make checks payable to: Superintendent of Documents, U. S. Government Printing Office.

WASTEWATER TREATMENT CONSTRUCTION DATA BASE

Awards for the wastewater treatment facilities construction grants under Public Law 92-500 made during a particular month are listed in a monthly publication entitled "Wastewater Treatment Construction Data Base - Public Law 92-500 Project Records." This publication is prepared by the Grants Administration Division and distributed and sold by the National Technical Information Services.

The March 1974, issue (PB 23130) provides a base listing of all grants awarded under Public Law 92-500. Beginning with the April 1974, issue (PB 231300-01) the listings will contain awards for one month only and will be numbered in sequence. Microfiche (24X) of each copy is also available. The subscription price is $100.00 for 12 issues. Previous issues can be purchased at $25.00 a copy.

The publication is distributed to subscribers approximately six weeks after the close of the awards-listed month. It may be obtained through:

National Technical Information Services
U. S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22151

NOTE: All of the preceeding publications are available for examination at the Grants Office and Library of EPA Headquarters and each Regional Office.

NEW STATE PROJECT PRIORITY LIST PUBLISHED

State Project Priority Lists are expected to include projects planned for EPA funding thru the next September. Lists from some States may include a lesser number of projects, or in a few cases, a project priority list for a particular State may not have been available for inclusion in the publication. Information on the various aspects of the projects would be available only thru the respective State Water Pollution Control Agency or the EPA Regional Office, if the State has completed its processing of the application. A list of State Water Pollution Control Agencies is contained in the EPA publication "Federal Assistance Programs of the Environmental Protection Agency" listed below.

Addendums to the "Project Priority List" will be issued as these lists become available. To avoid delaying the publication of the material on hand, this Project Priority List will be issued through NTIS as part of the subscription service for the "Wastewater Treatment Construction Grants Data Base."

The "State Project Priority List" should be used in conjunction with the "WWT Data Base" since the making of an award on a project contained on this list is reflected in the monthly issue of the "WWT Data Base." Because of this and the necessity of issuing addendums to purchasers of the initial priority list, the list wil not be sold separately.

"FEDERAL ASSISTANCE PROGRAMS OF THE ENVIRONMENTAL PROTECTION AGENCY"

This publication includes descriptive information about Environmental Protection Agency (EPA) assistance programs reprinted from the Catalog of Federal Domestic Assistance, which was prepared for the Office of Management and Budget. Similar information on programs of all Federal agencies is included in the Catalog which is available from the Superintendent of Documents, Government Printing Office, Washington D. C. 20420 for $17.00 and includes charges as issued for the 1975 edition. It is also available for public use in Federal Depository Libraries.

The EPA Regional Offices and the Water Pollution Control Agency of each State are listed in the Appendixes. Applications for Wastewater Treatment Construction Grants should be obtained through the State Water Pollution Control Agencies. This booklet contains general information about the EPA grant programs useful to an applicant.

This booklet is revised periodically to reflect program changes and new legislation which affect EPA assistance programs.

Copies of this booklet may be obtained from the Environmental Protection Agency, Grants Information, Grants Administration Division (PM-216), Office of Planning and Management, Washington, D.C. 20460.

OTHER GRANT RELATED INFORMATION

A 200-250 word summary of a grant project is available on the majority of research and demonstration grants.

These summaries are available only for projects that have received EPA funding. In rare instances, a grant application may contain privileged information and is so designated. For these, only the award data, such as grant number, applicant's name, organization, location, grant title, grant amount awarded, and award date is available; other information may be available depending on the particular circumstances.

The Smithsonian Science Information Exchange (SSIE) Rm. 300 1730 M Street, N.W., Washington, D.C. 20036, receives a copy of the summary of a grant and makes it available to the public on a fee basis. The cost of a print-out, if the Agency is identified and the grant or contract number is provided, costs $1 per grant number with a $10 minimum fee. A Search on a subject (topic) is $50 per search service for 1 to 50 titles, and in addition $10 for up to 50 additional titles. A search on the investigators name can also be performed. All inquiries and request for this service should be addressed to SSIE or phone (202) 381-5511.

REPORTS GENERATED BY GRANT SUPPORTED PROJECTS

Final reports and other program reports generated by grant supported projects are published and made available if merited. Grants Administration Division does not have the responsibility for the technical monitoring of grants projects, this is the programs function; therefore, program and final report information is available from the following program offices:

For solid waste management and resource recovery:

Publication and Distribution Unit
Office of Solid Waste Management
EPA, Cincinnati, OH. 45268

For air pollution control:

Air Research Technical Information Center
Environmental Protection Agency
Research Triangle Park, North Carolina 27711

For pesticide publications:

Information Section
Office of Pesticide Programs
EPA, Washington, D.C. 20460

For water:

Publications Branch (water) Research
Information Division
EPA, Washington, D.C. 20460

For other research and demonstration projects:

Technical Information Staff
Office of Research & Development
EPA, Cincinnati, Ohio 45268

Each of the above units publishes a bibliographic list showing price and giving purchasing information.

EPA REPORTS BIBLIOGRAPHY QUARTERLY

~~This~~ Quarterly bibliography series supplement the original one (EPA-LIB-73-01; PB-223 693) dated July 1973 and the first supplement (EPA-LIB-74-03; PB-234 215) dated August 1974, and the second supplement (PB-238 800) dated December 1974. It contains citations, abstracts and author, corporate source, subject, contract, and title indexes for all U.S. Environmental Protection Agency and its predecessor agencies' reports entered into the NTIS collection in the period noted.

The original bibliography, and the ~~first and second~~ supplements should provide sufficient information for any user to identify any EPA report desired. Copies of the individual reports will be available from NTIS in either hard copy or on microfiche. NTIS will also provide the EPA reports in microfiche as a set; cost figures may be obtained from NTIS. EPA libraries contain complete sets of microfiche on all items included in these bibliographies. In addition, a complete set has been made available to 25 foreign countries which now have, or are contemplating, the establishment of an environmental agency.

SUBSCRIPTION SERVICE

Starting in January 1975, all items entered into the NTIS information collection have been collected quarterly and published in a continuing series. You may start your subscription to this series by sending your order with payment to:

Subscriptions
National Technical Information Service
Springfield, VA 22161

An annual subscription to "EPA Reports Bibliography Quarterly" costs $45 (U.S.); $60 for addresses outside of the U.S. Individual copies can be ordered when available at a cost of $15 each (U.S.); $20 for addresses outside the U.S.

A few EPA reports announced by NTIS prior to December 1974 were omitted from the original EPA Reports Bibliography, EPA-LIB-73-01 and subsequent supplements. Those reports are included in this Quarterly.

Library Systems Branch
Management and Organization Division
Office of Administration
Office of Planning and Management

The following EPA libraries maintain complete sets of EPA reports, on microfiche, covered by the original bibliography and ~~this~~ supplements.

Region I Library
Room 2211-B, JFK Federal Bldg.
Boston, Massachusetts 02203

National Marine Water Quality Lab
P.O. Box 277
West Kingston, Rhode Island 02892

Region II Library
26 Federal Plaza
New York, New York 10007

Region II Field Office Library
Edison, New Jersey 08817

Region III Library
Curtis Bldg., 6th & Walnut Streets
Philadelphia, Pennsylvania 19106

Headquarters Library, Room 2404 WSM
401 M Street, S.W.
Washington, D.C. 20460

Region IV Library
1421 Peachtree Street, N.E.
Atlanta, Georgia 30309

Reference Library
Office of Administration
Research Triangle Park, North Carolina 27711

Southeast Environmental Research Lab
College Station Road
Athens, Georgia 30601

Gulf Breeze Laboratory
Sabine Island, Bldg. 29
Gulf Breeze, Florida 32561

Region V Library
1 North Wacker Drive
Chicago, Illinois 60606

Central Technical Library
National Environmental Research Center
Cincinnati, Ohio 45268

National Water Quality Laboratory
6201 Congdon Boulevard
Duluth, Minnesota 55804

Region VI Library
1600 Patterson Street
Dallas, Texas 75201

Robert S. Kerr Environmental Research Laboratory
P.O. Box 1198
Ada, Oklahoma 74820

Region VII Library
1735 Baltimore Avenue, Room 249
Kansas City, Missouri 64108

Region VIII Library
1860 Lincoln Street, Suite 900
Denver, Colorado 80203

National Field Investigation Center
Room A-1209, Bldg. 53
Box 25227, Denver Federal Center
Denver, Colorado 80225

Region IX Library
100 California Street
San Francisco, California 94111

National Environmental Research Center
P.O. Box 15027
Las Vegas, Nevada 89114

Region X Library
1200 Sixth Avenue
Seattle, Washington 98101

National Environmental Research Center
200 S.W. 35th Street
Corvallis, Oregon 97330

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APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
ALABAMA						
** RESEARCH **						
AUBURN UNIV. AUBURN	FATE & EFFECTS OF ATRAZINE IN SALT MARSH ECOSYSTEMS	ROUSE, R. D.	80383501	INCR	75/11/24	$17,640
TUSKEGEE INST. TUSKEGEE INST.	PHYSIOLOGICAL & BIOCHEMICAL EFFECTS OF AIR POLLUTANTS ON PLANTS	BASWAS, P.K.	80017003	CONT	75/12/04	$35,495

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	A R I Z O N A					
** RESEARCH **						
ARIZONA, UNIV. OF TUCSON	STUDY OF CHEMISTRY OF ION SELECTIVE ELECTRODES & ITS APPLICATION TO QUASI-REAL TIME MONITORING	FREISER, HENRY	80338902	CONT	75/10/31	$39,993
ARIZONA, UNIV. OF TUCSON	USE OF LIME,IRON OXIDES&FLUX CONTROL IN DESIGN OF DISPOSAL-SITE LINERS TO MINIMIZE POLLUTION MIGRATI	FULLER, WALLACE H.	80398801	NEW	75/10/01	$69,045
ARIZONA, UNIV. OF TUCSON	HAZARDOUS WASTE RESEARCH SYMPOSIUM: RESIDUAL MANAGEMENT BY LAND DISPOSAL	FULLER, WALLACE H.	80433001	NEW	75/12/02	$17,742
** DEMONSTRATION **						
ARIZONA DEPT OF HEALTH SVCS PHOENIX	IMPLEMENT ARIZ SOLID WASTE PROGRAM	JAMES GOFF	00909101	NEW	75/11/06	$65,000
** TRAINING **						
ARIZONA, UNIV. OF TUCSON	TRAINING IN WATER POLLUTION CONTROL	SIEFKA, RAYMOND A.	90018605	CONT	75/09/30	$22,731

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
ARKANSAS						
** TRAINING **						
ARK ST DEPT OF EDUC, PULASKI VOC/TECH LITTLE ROCK	SOLID WASTE MANPOWER TRAINING	JAMES JONES, DIRECTOR	00611701	NEW	75/09/08	$15,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	CALIFORNIA					
** RESEARCH **						
CALIFORNIA INST. OF TECH. PASADENA	RELATIONSHIP OF THE SMOG AEROSOL TO POLLUTION SOURCES	FRIEDLANDER, S. K.	80216003	INCR	75/11/20	$22,395
			80216003	INCR	75/12/02	$40,000
CALIFORNIA INST. OF TECH. PASADENA	MODELING OF PLUMES FROM MULTIPLE COOLING TOWERS	KOCH, ROBERT C. Y.	80398901	NEW	75/11/24	$49,851
CALIFORNIA, UNIV. OF RIVERSIDE	MECHANISMS OF PHOTOCHEMICAL REACTIONS IN URBAN AIR	PITTS, JAMES N.	80064917	CONT	75/11/24	$120,000
CALIFORNIA, UNIV. OF SANTA BARBARA	OIL SPILL & OIL POLLUTION REPORTS	OFFEN, HENRY	80306301	INCR	75/10/17	$8,000
CALIFORNIA, UNIV. OF LOS ANGELES	HUMAN BODY BURDENS OF ARSENIC & SELENIUM AS A RESULT OF WATER CONTAMINATION	VALENTINE, JANE L.	80379801	NEW	75/10/08	$56,046
CALIFORNIA, UNIV. OF SANTA BARBARA	OIL SPILL & OIL POLLUTION REPORTS	DEWITT, FLOYD A.	80399201	NEW	75/11/24	$43,349
CALIFORNIA, UNIV. OF BERKELEY	PREPARATION OF REFUSE FOR ENERGY RECOVERY	TREZEK, GEORGE J.	80403401	NEW	75/10/22	$175,000
CALIFORNIA, UNIV. OF LA JOLLA	NATIONAL MARINE POLLUTION MONITORING PROGRAM	GOLDBERG, EDWARD D.	80421501	NEW	75/11/14	$380,000
CALIFORNIA, UNIV. OF DAVIS	FIELD MEASUREMENT OF DENTRIFICATION	ROLSTON, DENNIS E.	80425901	NEW	75/11/04	$118,300

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	C A L I F O R N I A					
** RESEARCH **						
HYDROCOMP, INC. PALO ALTO	DEVELOPMENT OF A NON-POINT SOURCE POLLUTANT LOADING MODEL	CRAWFORD, NORMAN H.	80331501	INCR	75/11/07	$49,954
LAC/USC MEDICAL CENTER LOS ANGELES	A BIOLOGIC INDICATOR FOR AIR POLLUTION	SHERWIN, RUSSELL	80088105	INCR	75/09/26	$58,017
SAN JOSE STATE UNIV. FDN. SAN JOSE	AIR POLLUTION BACKGROUND PROFILES FOR AIR QUALITY SIMULATION MODELS	MACKAY, KENNETH	80223503	CONT	75/12/09	$23,029
STANFORD UNIV. STANFORD	SOLUBLE ORGANIC NITROGEN CHARACTERISTICS & REMOVAL	MCCARTY, PERRY L.	80400102	CONT	75/09/05	$40,275
** DEMONSTRATION **						
CALIFORNIA RESOURCES AGENCY SACRAMENTO	SOLID WASTE MANAGEMENT	MARINO, ALBERT	00909301	INCR	75/11/05	$100,000
CALIFORNIA STATE DEPT OF HEALTH	IMPLEMENTATION OF CALIFORNIA'S HAZARDOUS WASTE MGMT. PROGRAM	COLLINS, HARVEY F.	00907001	INCR	75/11/05	$200,000
FOREMOST-MCKESSON INC. DUBLIN	A DEMONSTRATION PROJECT ON THE UTILIZATION OF CHEESE WHEY FOR WINE PRODUCTION	HOSKINS, WILLIAM A.	80386301	NEW	75/09/24	$85,093
** TRAINING **						
BAY AREA SEWAGE SERVICES AGENCY	WWT PLANT OPERATOR TRAINING & SIMULATION	SOLTOW, PAUL C.	00906501	INCR	75/09/16	$9,915
CALIFORNIA ST WATER RES CON BD SACRAMENTO	AID IN CONSTRUCTION AND ADDITIONS TO SAN MARCOS TRAINING CENTER	DENDY, BILL	00907501	NEW	75/07/23	$10,000

CALIFORNIA

** TRAINING **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
CALIFORNIA, UNIV. OF DAVIS	ENVIRONMENT ENGINEERING INCLUDING IRRIGATION SCIENCE AND CHEMICAL ENGINEERING	KRONE, RAY B.	90013106	CONT	75/10/03	$8,076
CALIFORNIA, UNIV. OF BERKELEY	SANITARY ENGR.	SELLECH, ROBERT E.	90019005	INCR	75/09/12	$57,468
SIERRA CLUB FDN. SAN FRANCISCO	ENVIRONMENTAL PARAMETERS OF SOLID WASTE	CLUSEN, CHARLES M.	90044401	INCR	75/11/18	$697
STANFORD UNIV. STANFORD	ENVIRONMENTAL AND WATER QUALITY MANAGEMENT	MCCARTY, PERRY L.	90013308	CONT	75/09/25	$40,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	COLORADO					
** RESEARCH **						
COLORADO SCH. OF MINES RES. INST. GOLDEN	MINERALOGY OF OVERBURDEN RELATED TO GROUND-WATER DEGRADATION IN STRIP MINING OF COAL	KLOEPPER, DEAN L.	80416201	NEW	75/11/24	$300,000
COLORADO STATE UNIV. FORT COLLINS	IRRIGATION RETURN FLOW QUALITY LITERATURE ABSTRACTING	SKOGERHOE, GAYLORD	80042605	CONT	75/10/24	$21,278
COLORADO, UNIV. OF BOULDER	HEALTH EFFECTS OF CONSUMPTION OF RENOVATED WATER-CHEMISTRY & CYTOTOXICITY	CHAPPELL, WILLARD R.	80396801	NEW	75/10/03	$54,180
RESOURCES ADMIN. & DEVELOPMENT, INC. FORT COLLINS	ACHIEVING IRRIGATION RETURN FLOW QUALITY CONTROL THROUGH IMPROVED LEGAL SYSTEMS	RADOSEVICH, GEORGE E.	80430301	NEW	75/12/05	$46,098
** DEMONSTRATION **						
COLORADO STATE UNIV. FORT COLLINS	IMPLEMENTATION OF AGRICULTURAL SALINITY CONTROL TECHNOLOGY IN GRANT VALLEY	SKOGERBOE, GAYLORD	80298502	INCR	75/10/22	$26,457
** TRAINING **						
COLORADO MUNICIPAL LEAGUE WHEAT RIDGE	1975 COLORADO MUNICIPAL LEAGUE SOLID WASTE MANAGEMENT WORKSHOP	GEORGE GRKOVIC, COORDI	00812901	NEW	75/10/17	$2,000
COLORADO STATE UNIV. FORT COLLINS	WATER QUALITY MICROBIOLOGY & ENGINEERING	MORRISON, S. M.	90026605	CONT	75/09/25	$35,000
			90026605	INCR	75/12/11	$24,820
COLORADO STATE UNIV. FORT COLLINS	TRAINING PROGRAM ON MOTOR VEHICLE EMISSIONS CONTROL FOR AUTOMOTIVE TEACHERS	HAYES, D. B.	90054801	INCR	75/09/04	$10,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		C O N N E C T I C U T				
** TRAINING **						
CONNECTICUT DEPT OF ENVRN PROTECT HARTFORD	WWT PLANT OPER. TRAIN. COURSE	MELVIN J. SCHNEIDERMEY	00108001	NEW	75/12/08	$6,828

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	D E L A W A R E					
** RESEARCH **						
DELAWARE STATE COLLEGE DOVER	AN ENVIRONMENTAL HEALTH STUDY OF LEAD IN TEETH	WILKINSON, DONALD R.	80289002	CONT	75/11/24	$20,603
DELAWARE, UNIV. OF LEWES	MARINE FLORA AND FAUNA OF THE NORTHEASTERN UNITED STATES	CARRIKER, MELBOURNE R.	80422601	NEW	75/10/31	$18,000

DISTRICT OF COLUMBIA

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
AMERICAN PETROLEUM INST. WASHINGTON	API - REFINERY SOUR WATER STRIPPER STUDIES	GANTZ, RONALD G.	80436401	NEW	75/12/03	$75,000
AMERICAN UNIV. WASHINGTON	BIREFRINGENT FILTER FOR OPTICAL MONITORING OF AIR POLLUTANTS	KAY, R. B.	80070803	INCR	75/11/07	$20,000
HOWARD UNIV. WASHINGTON	RADIOIMMUNOASSAY OF METALLOTHIONEIN	FRIEDBERG, FELIX	80320102	CONT	75/09/30	$37,734
NATIONAL CENTER FOR RESOURCE RECOVERY WASHINGTON	MATERIALS & FUEL RECOVERY PROCESSING RESEARCH AT PILOT PLANT SCALE	ALTER, HARVEY	80390101	NEW	75/08/19	$339,806
NATIONAL CENTER FOR RESOURCE RECOVERY WASHINGTON	PREPARATION, USE & COST OF D-RDF AS A SUPPLEMENTARY FUEL IN STOKE FIRED BOILERS	ALTER, HARVEY	80415001	NEW	75/08/13	$270,464
** DEMONSTRATION **						
INTERNATIONAL CITY MANAGEMENT ASSOC. WASHINGTON	SOLID WASTE TECHNICAL ASSISTANCE FOR LOCAL GOVERNMENT MANAGERS	BARTOLOTTA, ROBERT J.	80436001	NEW	75/12/18	$65,507
** TRAINING **						
AMERICAN ASSOC OF STATE COLLEGE & UNIV WASHINGTON	PLANNING PROJECT FOR A NATIONAL COOPERATIVE PROGRAM IN ENVRN. MANPOWER TRAINING & EDUCATION	FULKERSON, WILLIAM M.	90056601	NEW	75/09/11	$45,304
AMERICAN FORESTRY ASSOC. WASHINGTON	APPROACHES TO NON-POINT SOURCE POLLUTION CONTROL IN FORESTRY ACTIVITIES	PARDO, RICHARD	90054401	INCR	75/10/03	$14,179
DISTRICT OF COLUMBIA GOVT. WASHINGTON	TV SPOTS FOR PUBLIC SERVICE ANNOUNCEMENT IN SOLID WASTE	MCKINNEY, WILLIAM C.	90067201	NEW	75/10/07	$15,000

DISTRICT OF COLUMBIA

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** TRAINING **						
NATIONAL ASSOC. OF COUNTIES WASHINGTON	PROJECT TO ASSIST LOCAL GOVERNMENTS TO IMPLEMENT WASTEWATER CONSTRUCTION PROJECTS	MASLIN, WILLIAM R.	90057001	NEW	75/12/31	$256,265
** FELLOWSHIPS **						
GEORGE WASHINGTON UNIV. WASHINGTON	M.S./ENVRN. LAW	PEARSON, ERIC R.	91072801	NEW	75/12/16	$7,718

F L O R I D A

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
FLORIDA STATE UNIV. TALLAHASSEE	SOURCES & TRANSPORT OF TRACE METALS IN URBAN AEROSOLS	WINCHESTER, JOHN W.	80213203	INCR	75/08/29	$28,165
			80213203	INCR	75/09/23	$22,500
FLORIDA STATE UNIV. TALLAHASSEE	ELEMENTAL QUANTITATIVE ANALYSIS OF AIR PARTICULATE MATTER BY PROTON SCATTERING	NELSON, J. WILLIAM	80291302	INCR	75/08/28	$20,000
FLORIDA STATE UNIV. TALLAHASSEE	INTERMOLECULAR INTERACTIONS BETWEEN ENVRN. TOXIC SUBSTANCES & BIOLOGICAL MACROMOLECULES	LEVY, GEORGE C.	80309502	CONT	75/09/30	$24,962
FLORIDA STATE UNIV. TALLAHASSEE	MESOSCALE SULFUR BALANCE STUDIES	WINCHESTER, JOHN W.	80388701	NEW	75/11/14	$245,603
MIAMI, UNIV. OF CORAL GABLES	CHARACTERIZATION OF METHANOL/GASOLINE BLENDS AS AUTOMOTIVE FUEL	ADT, ROBERT R.	80340102	CONT	75/11/14	$98,064

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	GEORGIA					
** RESEARCH **						
GEORGIA INST. OF TECH. ATLANTA	CONTROLLED LANDFILL STABILIZATION WITH LEACHATE CONTAINMENT & RECYCLE	POHLAND, FREDERICK G.	80395301	NEW	75/09/26	$25,000
GEORGIA STATE UNIV. ATLANTA	MICROBIAL INTERACTIONS WITH PESTICIDES IN ESTUARINE SURFACE SLICKS	HEARN, DONALD G.	80314102	INCR	75/11/07	$13,000
GEORGIA, UNIV. OF ATHENS	NEW LIQUID-CHROMATOGRAPHIC DETECTION SYSTEMS FOR ENVIRONMENTAL POLLUTANTS	CARREIRA, L. A.	80415501	NEW	75/11/07	$90,520
** TRAINING **						
GEORGIA INST. OF TECH. ATLANTA	GRADUATE TRAINING IN WATER QUALITY MANAGEMENT	KAHN, BERNARD	90011107	CONT	75/09/25	$50,238

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	HAWAII					
** RESEARCH **						
HAWAII CNTY. HILO	RESOURCE RECOVERY STUDY OF THE COUNTY OF HAWAII	HARADA, EDWARD	80392401	NEW	75/08/13	$50,000
HAWAII, UNIV. OF KANEOHE	KANEOHE BAY: RESPONSES OF A TROPICAL ESTUARY TO RELAXATION OF SEWAGE STRESS	SMITH, STEPHEN V.	80398301	NEW	75/10/24	$160,244

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	I D A H O					
** RESEARCH **						
IDAHO, UNIV. OF MOSCOW	EVALUATION PRACTICES & SYSTEMS FOR CONTROLLING LOSS SEDIMENT & OTHER POLLUTANTS FROM IRRIGATED LANDS	FITZSIMMONS, D. W.	80352402	CONT	75/12/09	$100,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	I L L I N O I S					
** RESEARCH **						
IIT RES. INST. CHICAGO	A STUDY OF THE IDENTITY & SOURCES OF ATMOSPHERIC AEROSOLS	DRAFTZ, RONALD G.	80307803	CONT	75/10/03	$30,000
ILLINOIS, UNIV. OF URBANA	EFFECT OF MOISTURE REGIME ON SOLID WASTE STABILIZATION	CHIAN, E. S. K.	80365201	INCR	75/10/02	$4,200
NORTHWESTERN UNIV. EVANSTON	EVALUATION OF TERTIARY GRANULAR MEDIA-NORTHWESTERN UNIV	FITZPATRICK, J.A.	80321201	INCR	75/12/31	$22,800
PAWNEE, VILLAGE OF PAWNEE	ONE-YEAR PERFORMANCE EVALUATION OF LAGOON SYSTEM, PAWNEE, ILLINOIS	ALEXANDER, ROGER	80390001	INCR	75/10/03	$60,123
** TRAINING **						
AMERICAN PUBLIC WORKS ASSOC. CHICAGO	PERFORMANCE EVALUATION & TROUBLE SHOOTING PROCEDURES - WWT	SULLIVAN, RICHARD H.	90053502	CONT	75/11/24	$51,435
ILLINOIS, UNIV. OF URBANA	WATER QUALITY CONTROL	ENGELBRECHT, R. S.	90031205	CONT	75/09/30	$38,263

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	I N D I A N A					
** RESEARCH **						
PURDUE RES. FDN. WEST LAFAYETTE	EFFECT OF POLLUTANTS ON THERMAL STRUCTURE & DESPERSION IN URBAN ATMOSPHERE	VISKANTA, RAYMOND	80351402	CONT	75/11/24	$35,000
PURDUE RES. FDN. WEST LAFAYETTE	OCCURRENCE & EFFECTS OF ORGANIC COMPOUNDS IN DRINKING WATER	CARLSON, GARY P.	80432801	NEW	75/10/24	$28,018
** TRAINING **						
NOTRE DAME, UNIV. OF NOTRE DAME	JOINT PROGRAM IN ENVIRONMENTAL ENGINEERING & LAW	IRVINE, ROBERT L.	90006505	INCR	75/09/29	$35,018
** FELLOWSHIPS **						
PURDUE UNIV. WEST LAFAYETTE	M.S./CIVIL ENGR.	BRYAN, HOWARD	91045201	INCR	75/11/14	$25
PURDUE UNIV. WEST LAFAYETTE	M.S./CIVIL ENGINEERING	BULLOCK, LAWRENCE F.	91070401	NEW	75/12/18	$7,688

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		I O W A				
** RESEARCH **						
AMES, CITY OF AMES	EVALUATION OF AMES SOLID WASTES RESOURCES & ENERGY RECOVERY SYSTEM	CHANTLAND, A. O.	80390301	NEW	75/12/05	$390,784
SOUTHERN IOWA COUNCIL OF GOV'TS CRESTON	PROJECT FOR RURAL DEVELOPMENT IN SEVEN COUNTY AREA	LANA, PATRICK G EXEC D	00710001	NEW	75/11/13	$30,000
** TRAINING **						
IOWA DEPT ENVIRONMENTAL QUALITY DES MOINES	TRAINING GRANT FOR SEMINAR	CRANE, LARRY E EXEC DI	00706701	NEW	75/09/17	$5,000
IOWA STATE UNIV. AMES	ENGINEERING DESIGN OF WATER POLLUTION CONTROL SYSTEMS	BAUMANN, E. ROBERT	90017608	CONT	75/09/25	$73,383
** FELLOWSHIPS **						
IOWA, UNIV. OF IOWA CITY	M.S./ENVRN. ENGR.	JOHNSON, LYLE D.	91053301	INCR	75/11/14	$63
IOWA, UNIV. OF IOWA CITY	M.S./ENVRN. ENGR.	LIECHTY, DAVID W.	91053801	INCR	75/11/14	$84

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	KENTUCKY					
** DEMONSTRATION **						
CAMPBELL/KENTON CNTY. SANITATION DIST. COVINGTON	INTERIM WWT PLANT DEMONSTRATION	HENSON, E. BRENTON	80271901	INCR	75/10/03	$24,990
KENTUCKY DEPT. OF NATURAL RESOURCES FRANKFORT	MODIFIED BLOCK CUT UTILIZING ON-SITE CONTROL OF SURFACE MINE SEDIMENTATION	MCCLAIN, DANNY A.	80268102	CONT	75/12/05	$209,543
** TRAINING **						
KENTUCKY DEPT FOR NATURAL RESOURCES FRANKFORT	CONDUCT TRAINING SESSIONS ON TOXIC & HAZ WASTES	SAMUEL N JOHNSON	00416801	NEW	75/12/31	$5,000

L O U I S I A N A

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
GRAMBLING STATE UNIV. GRAMBLING	THE EFFECTS OF CADMIUM ON THE ULTRASTRUCTURE OF TYPE A SPERMATOGONIA	JORDAN, CHESTER L.	80315402	CONT	75/12/18	$13,293
LOUISIANA STATE UNIV. & A&M COLLEGE BATON ROUGE	DIRECT & CONTINUOUS DETERMINATION OF METALS IN AIR	ROBINSON, JAMES W.	80077105	INCR	75/12/02	$3,000
** DEMONSTRATION **						
GULF SOUTH RES. INST. BATON ROUGE	DEVELOPMENT OF TREATMENT & CONTROL TECHNOLOGY FOR REFRACTORY PETROCHEMICAL CONTROL	RYAN, JAMES	80077301	INCR	75/10/31	$64,930
** TRAINING **						
JEFFERSON PARISH DEPT DRNGE & SEWERAGE METAIRIE	WASTEWATER TREATMENT FACILITY OPERATOR TRAINING	RAY L CONDON JR	00612301	NEW	75/11/03	$12,000
** FELLOWSHIPS **						
TULANE UNIV. NEW ORLEANS	M.S./PUBLIC HEALTH	SANDERS, JOHNNY W.	91073601	NEW	75/12/18	$10,265

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		M A I N E				
** TRAINING **						
MAINE DEPT. OF ENVRN. PROTECTION AUGUSTA	WWT PLANT OPER. TRAIN.-PROCESS CONTROL TECHNIQUES	WILLIAM R. ADAMS, JR.	00108101	NEW	75/12/03	$8,727

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
M A R Y L A N D						
** RESEARCH **						
ELECTRO-NUCLEONICS LABORATORIES, INC. BETHESDA	IDENTIFICATION, ISOLATION & CHARACTERIZATION OF INFECTIOUS HEPATITIS (HEPATITIS A) AGENT	HALL, W. T.	80400303	CONT	75/12/09	$125,300
JOHNS HOPKINS UNIV. BALTIMORE	IMPACT OF WATERFOWL ON MICROBIAL POPULATION OF ESTUARIES W/REFERENCE DISSEMINATION HUMAN PATHOGENS	SLADEN, WILLIAM J.L.	80420701	NEW	75/12/09	$24,962
MARYLAND DEPT. OF NATURAL RESOURCES BALTIMORE	AIRBORNE MONITORING STUDY:HYPERBOLIC COOLING TOWER EFFLUENTS & INTERACTIONS	NIETUBICZ, RICHARD	80396901	NEW	75/11/24	$125,000
MARYLAND, UNIV. OF COLLEGE PARK	FIELD INVESTIGATION CHLORINATED&BROMINATED ORGANIC COMPOUNDS FORMED SALINE POWER PLANT COOLING WATER	HELZ, GEORGE R.	80383901	INCR	75/12/02	$16,000
MARYLAND, UNIV. OF COLLEGE PARK	IMPACT OF WATERFOWL ON MICROBIAL POPULATION OF ESTUARIES W/REFERENCE DISSEMINATION HUMAN PATHOGENS	WEINER, RONALD M.	80420601	NEW	75/12/09	$26,638
** TRAINING **						
MARYLAND DEPT. HEALTH & MENT HYGIENE BALTIMORE	WPC TRAINING GRANT	NOREN, DONALD H.	00311201	NEW	75/09/02	$1,500
** FELLOWSHIPS **						
JOHNS HOPKINS UNIV. BALTIMORE	M.A./SYSTEMS ANALYSIS & ECONOMICS FOR PUBLIC DECISION MAKING/WATER RESOURCES MGMT.	CLARKE, JANICE R.	91068901	INCR	75/11/12	$392

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	M A S S A C H U S E T T S					
** RESEARCH **						
BOSTON UNIV. BOSTON	SUBLETHAL EFFECTS OF OIL ON BEHAVIOR & CHEMICAL SENSES OF MARINE ANIMALS	ATEMA, JELLE	80383301	NEW	75/10/01	$50,248
HARVARD UNIV. CAMBRIDGE	PHYSIOLOGICAL RESPONSE TO ATMOSPHERIC POLLUTANTS	AMDUR, MARY O.	80203020	CONT	75/12/09	$61,457
MASSACHUSETTS INST. OF TECH. CAMBRIDGE	CATALYTIC DESULFURIZATION & DENITROGENATION	SATTERFIELD, C. N.	80412301	NEW	75/12/16	$45,178
NEW ENGLAND MEDICAL CTR. HOSPITAL BOSTON	RELATIONSHIP OF BLOOD LEAD LEVELS TO LEAD IN HOUSEHOLD DRINKING WATER	WORTH, DOROTHY	80279401	INCR	75/08/22	$12,256
** DEMONSTRATION **						
BRAINTREE, TOWN OF EAST BRAINTREE	MORTON P. POTTER STATION UNIT NO. 2	SPURRELL, ALBAN G.	80375701	NEW	75/12/02	$500,000
MARBLEHEAD, TOWN OF MARBLEHEAD	DEMONSTRATION OF MULTI-MATERIAL SOURCE SEPARATION	REED, RAYMOND A.	80375801	INCR	75/10/17	$3,363
** TRAINING **						
MASSACHUSETTS AUDUBON SOCIETY LINCOLN	NATIONAL ENVIRONMENTAL FELLOWSHIP ALLIANCE	COOK, JOHN R.	90056301	NEW	75/11/06	$10,000
NEW ENGLAND INTERSTATE WPCC BOSTON	WWTP OPER. TRAIN. IN PROCESS CONTROL TECHNIQUES	ALFRED E. PELOQUIN	00108401	NEW	75/12/03	$10,007
NEW ENGLAND INTERSTATE WPCC BOSTON	MUNICIPAL OFFICIAL TRAIN. PROG. IN WPC ACT AMENDMENTS	ALFRED E. PELOQUIN	00108501	NEW	75/12/23	$18,200

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MASSACHUSETTS						
** TRAINING **						
NORTHEASTERN UNIV. BOSTON	TRAINING IN WATER QUALITY ENGINEERING	COCHPANE, JOHN	90018004	CONT	75/09/25	$32,304
TUFTS UNIV. MEDFORD	GRADUATE TRAINING FOR ENVIRONMENTAL ENGINEERING	HANES, N. BRUCE	90015208	CONT	75/09/30	$49,989
** FELLOWSHIPS **						
HARVARD UNIV. CAMBRIDGE	AIR POLLUTION PLANNING	WAGNER, TIMOTHY	91072901	NEW	75/12/23	$5,050

MICHIGAN

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MICHIGAN STATE UNIV EAST LANSING	DETERMINE SOURCES, FORMS & AMOUNT OF POLLUTION REACHING GREAT LAKES DUE TO LAND USE PRACTICES	WHARTON, CLIFTON A.	00514301	INCR	75/08/28	$92,000
			00514301	INCR	75/12/23	$184,000
MICHIGAN STATE UNIV. EAST LANSING	NITRATE AND PHOSPHORUS RUNOFF FROM A WATERSHED IN THE GREAT LAKES BASIN	ELLIS, BOYD G.	80297402	INCR	75/11/12	$5,814
MICHIGAN TECH. UNIV. HOUGHTON	USE OF POTASSIUM FERRATE IN OXYGEN DEMAND MEASUREMENT	JOHNSON, JOHN H.	80259602	CONT	75/11/07	$68,945
MICHIGAN TECH. UNIV. HOUGHTON	DEVELOPMENT OF EMISSION & FUEL ECONOMY COMPUTER MODEL FOR HEAVY DUTY TRUCKS & BUSES	JOHNSON, JOHN H.	80378201	NEW	75/11/03	$25,600
MICHIGAN, UNIV. OF ANN ARBOR	METABOLIC INTERACTIONS OF HORMONAL STEROIDS & CHLORINATED HYDROCARBONS	MASON, MERLE	80063703	INCR	75/11/17	$3,195
MICHIGAN, UNIV. OF ANN ARBOR	WATER QUALITY IMPACTS OF SEDIMENTS DREDGING IN LARGE LAKES SYSTEMS	WEBER, WALTER J.	80111203	INCR	75/10/31	$294
MICHIGAN, UNIV. OF ANN ARBOR	BIOLOGICAL RESPONSES TO EUTROPHICATION IN SAGINAW BAY & LAKE HURON	STOERMER, EUGENE F.	80278002	INCR	75/12/12	$136,600
MICHIGAN, UNIV. OF ANN ARBOR	WATER QUALITY STUDIES ON RIVER NILE & LAKE NASSER	MANCY, KHALIL H.	80329102	CONT	75/09/26	$14,220
MICHIGAN, UNIV. OF ANN ARBOR	LONG PATH AIR POLLUTION MONITOR EVALUATION	BARTMAN, FREDERICK L.	80339902	CONT	75/10/03	$35,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	M I C H I G A N					
** RESEARCH **						
MICHIGAN, UNIV. OF ANN ARBOR	STUDY OF PARTICULATE EMISSION FROM DIESEL ENGINES	SPRINGER, GEORGE S.	80371001	NEW	75/10/29	$36,840
MICHIGAN, UNIV. OF ANN ARBOR	OPTIMAL SAMPLING STRATEGIES FOR WATER QUALITY IN LARGE LAKES	CANALE, RAYMOND P.	80375401	NEW	75/10/08	$31,146
NATIONAL SANITATION FOUNDATION ANN ARBOR	2ND NATIONAL CONFERENCE ON INDIVIDUAL ONSITE WASTEWATER SYSTEMS	MCCLELLAND, N. I.	80430801	NEW	75/11/24	$6,000
** DEMONSTRATION **						
WYOMING, CITY OF WYOMING	PARALLEL OZONATION & CHLORINATION WITH DECHLORINATION OF CHLORINATED EFFLUENTS	SHEERAN, JAMES A.	80229201	INCR	75/11/24	$165,110
** TRAINING **						
MICHIGAN DNR LANSING	WASTEWATER TREATMENT PLANT OPERATOR TRAINING PROGRAM SEC 104	W G TURNEY CHIEF MGT	00515802	INCR	75/12/03	$2,000
MICHIGAN STATE UNIV. EAST LANSING	TRAINING IN AQUATIC POLLUTION ECOLOGY	ROELOFS, EUGENE W.	90033105	INCR	75/09/26	$40,133

M I N N E S O T A

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
MINNESOTA UNIVERSITY OF DULUTH	DETERMINE STATUS OF WATER QUALITY IN UPPER GREAT LAKES	JOHNSON, C. T.	00517501	INCR	75/08/25	$9,070
MINNESOTA, UNIV. OF MINNEAPOLIS	DEVELOPMENT OF BASIC AEROSOL STANDARDS	LIU, BENJAMIN Y.H.	80130105	CONT	75/10/29	$50,000
MINNESOTA, UNIV. OF MINNEAPOLIS	EFFECT OF CYANIDE ON FRESHWATER FISH & INVERTEBRATES	SMITH, LLOYD L.	80291402	INCR	75/12/16	$5,250
MINNESOTA, UNIV. OF MINNEAPOLIS	FORMATION OF ATMOSPHERIC AEROSOLS	WHITBY, KENNETH T.	80385101	INCR	75/09/19	$85,000
** DEMONSTRATION **						
DULUTH, CITY OF DULUTH	ASBESTIFORM PARTICLE FILTRATION DEMONSTRATION, DULUTH, MINNESOTA	PETERSON, DAVID L.	80422101	NEW	75/10/16	$4,000,000
ELY, CITY OF ELY	LAKE RESTORATION BY PHOSPHORUS CONTROL	GRAHEK, J. P.	80230901	INCR	75/12/11	$120,000
** TRAINING **						
MINNESOTA DEPT OF AGRICULTURE ST PAUL	WASTEWATER TREATMENT OPERATOR TRAINING PROGRAM SEC 104	R DENNISTOUN ADMR	00523701	NEW	75/07/16	$13,620
** FELLOWSHIPS **						
MINNESOTA, UNIV. OF MINNEAPOLIS	B.S./CIVIL ENGR.	FLYNN, LOUIS L.	91070301	NEW	75/12/11	$3,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
M I S S I S S I P P I						
** RESEARCH **						
MISSISSIPPI STATE UNIV. MISSISSIPPI ST.	DETERMINATION OF SITE OF ACTION SELECTED PESTICIDED BY ENZYMATIC-IMMUNOBIOLOGICAL APPROACH	KOCH, R. B.	80345801	INCR	75/12/17	$17,766
MISSISSIPPI STATE UNIV. MISSISSIPPI ST.	DETERMINATION OF THE SITE(S) OF ACTION OF SELECTED PESTICIDES	KOCH, ROBERT B.	80345802	CONT	75/12/17	$25,000
MISSISSIPPI VALLEY STATE UNIV. ITTA BENA	INTERACTION OF OZONE & HERBICIDES IN SOYBEANS	BAHADUR, RAJ	80307202	CONT	75/12/11	$21,070
** TRAINING **						
MISSISSIPPI STATE UNIV. MISSISSIPPI ST.	SCIENCE & PRACTICE OF WATER POLLUTION CONTROL	SHINDALA, ADNAN	90031405	INCR	75/09/30	$36,626
** FELLOWSHIPS **						
MISSISSIPPI STATE UNIV. JACKSON	AIR POLLUTION ABATEMENT	ADAMS, LEON	91072301	NEW	75/12/18	$705

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	M I S S O U R I					
** RESEARCH **						
WASHINGTON UNIV. ST. LOUIS	DYNAMICS OF URBAN AEROSOLS	HUSAR, RUDOLF B.	80281502	INCR	75/09/16	$105,000
WASHINGTON UNIV. ST. LOUIS	SULFUR BUDGET IN LARGE PLUMES	HUSAR, R. B.	80389601	INCR	75/09/16	$47,500
** TRAINING **						
MISSOURI DEPT OF NATURAL RESOURCES JEFFERSON CITY	TROUBLESHOOTING O & M PROBLEMS AT MUNICIPAL	WILSON, JAMES L DIRECT	00706901	NEW	75/10/30	$750
MISSOURI MUNICIPAL LEAGUE JEFFERSON CITY	ENVIRONMENTAL TRAINING SEMINARS	BELL, JAY T DIR	00707001	NEW	75/12/24	$5,000
MISSOURI, UNIVERSITY OF	PHASE I DEVELOPMENT OF STATEWIDE MANPOWER DEVELOPMENT PLAN	BEZONI, R H VICE PRES	00706801	NEW	75/09/17	$2,072

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
M O N T A N A						
** RESEARCH **						
MONTANA, UNIV. OF MISSOULA	INVESTIGATION OF BIOENVIRONMENTAL IMPACT OF FOSSIL FUEL POWER PLANTS IN FORT UNION BASIN OF MT	GORDON, C.C.	80321502	CONT	75/10/07	$80,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		N E B R A S K A				
** RESEARCH **						
NEBRASKA, UNIV. OF LINCOLN	USE OF POTASSIUM FERRATE IN OXYGEN DEMAND MEASUREMENT	CARR, JAMES D.	80383401	NEW	75/09/04	$15,585
** FELLOWSHIPS **						
NEBRASKA, UNIV. OF LINCOLN	MECHANICAL ENGR. & AIR POLLUTION	GRAMS, DENNIS D.	91027101	INCR	75/09/25	$137

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
N E V A D A						
** DEMONSTRATION **						
NEVADA DEPT OF HUMAN RESOURCES CARSON CITY	NEVADA SOLID WASTE PROGRAM	H, LAVERNE ROSSE	00909201	NEW	75/11/06	$35,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
NEW HAMPSHIRE						
** TRAINING **						
NEW HAMPSHIRE WS & PCC CONCORD	WWTP OPER. TRAIN. IN PROCESS CONTROL TECHNIQUES	RICHARD P. GROSSMAN	00108301	NEW	75/12/03	$8,938

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		N E W J E R S E Y				
** RESEARCH **						
PRINCETON UNIV. PRINCETON	USE OF SIMULATION FOR CHARACTERIZING TRANSPORT IN SOILS ADJACENT TO LAND DISPOSAL SITES	PINDER, GEORGE F.	80382701	NEW	75/10/01	$40,034
TEXTILE RES. INST. PRINCETON	NONWOVEN FABRICS AS FILTERS FOR REMOVAL OF PARTICULATE MATTER IN RESPIRABLE DUST RANGE	REBENFELD, LUDWIG	80004204	CONT	75/12/16	$61,786

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		NEW MEXICO				
** TRAINING **						
NEW MEXICO STATE UNIVERSITY LAS CRUCES	SEMINARS ON SAMPLING, ANALYSIS, & MONITORING UNDER THE SAFE DRINKING WATER ACT	WILLIAM BARKLEY	00611901	NEW	75/09/16	$11,191

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** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
AMERICAN HEALTH FDN. NEW YORK	ASBESTOS & GI TRACT CANCER: CELL CULTURE STUDIES	WILLIAMS, GARY	80399801	NEW	75/11/20	$196,700
AMERICAN INST. OF CHEMICAL ENGR. NEW YORK	THIRD NATL. CONFERENCE ON COMPLETE WATEREUSE: SYMBIOSIS AS MEANS OF ABATEMENT FOR MULTI-MEDIA POLL.	VAN ANTWERPEN, F.J.	80419501	NEW	75/10/08	$35,000
CENTER FOR POLICY RES., INC. NEW YORK	EPIDEMIOLOGICAL STUDY OF HEALTH EFFECTS AMONG SWIMMERS AT N.Y. RECREATIONAL BEACHES	HABERMAN, PAUL W.	80325403	CONT	75/08/05	$53,587
CORNELL UNIV. ITHACA	AUTOTROPHIC DENITRIFICATION USING SULFUR-ELECTRON DONORS	LAWRENCE, ALONZO W.	80350502	CONT	75/12/24	$45,111
FORDHAM UNIV. BRONX	BIOLOGICAL ANALYSIS OF PRIMARY PRODUCTIVITY & PROCESSES IN N.Y. HARBOR AS REFLECTIVE OF QUALITY	MCLAUGHLIN, JOHN J. A.	80337002	CONT	75/09/29	$110,000
NATIONAL COUNCIL OF PAPER INDUSTRY NEW YORK	PILOT INVESTIGATION OF SECONDARY SLUDGE DEWATERING ALTERNATIVES	BLOSSER, RUSSELL O.	80401901	NEW	75/10/01	$25,000
NATIONAL COUNCIL OF PAPER INDUSTRY NEW YORK	DEVELOPMENT OF A MGMT. STRATEGY FOR DETECTION & RECOVERY OF INTERMITTENT PROCESS LOSSES	BLOSSER, RUSSELL O.	80408601	NEW	75/10/01	$122,025
NEW YORK STATE DEPT. OF ENVRN. CONSERV ALBANY	SULFATE & PARTICULATE EMISSIONS FROM IN-USE CATALYST VEHICLES	GIBBS, RICHARD E.	80352002	CONT	75/12/17	$88,020
NEW YORK STATE DEPT. OF ENVRN. CONSERV ALBANY	RESEARCH ON AUTOMOBILE POLLUTION DISPERSION ("ROAD")	RAO, S. T.	80388101	INCR	75/12/09	$17,000
NEW YORK STATE DEC ALBANY	THE GENESEE RIVER PILOT WATERSHED STUDY	HETLING, LEO J.	000514401	INCR	75/08/28	$112,000
			00514401	INCR	75/12/13	$224,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	N E W Y O R K					
** TRAINING **						
CORNELL UNIV. ITHACA	WATER QUALITY CONTROL ENGINEERING	GATES, CHARLES D.	90012708	CONT	75/09/25	$35,000
CORNELL UNIV. ITHACA	AGRICULTURAL WASTE MANAGEMENT	LOEHR, RAYMOND C.	90014507	CONT	75/09/26	$44,980
NEW STATE DEPT. ENVRN. CONSERV. ALBANY	DEMONSTRATION OF A TWO YEAR AAS WATER QUALITY MONITORING PROGRAM	CAMPBELL, DANIEL J.	90054001	INCR	75/11/14	$31,386
NEW YORK POLYTECHNIC INST. BROOKLYN	WATER SUPPLY & POLLUTION CONTROL ENGINEER	MOLOF, ALAN H.	90019406	INCR	75/12/31	$30,983

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	NORTH CAROLINA					
** RESEARCH **						
DUKE UNIV. BEAUFORT	EFFECTS OF THERMAL ADDITIONS ON THE DYNAMICS OF FOULING COMMUNITIES AT BEAUFORT, N.C.	SUTHERLAND, JOHN P.	80385601	NEW	75/11/14	$54,702
NORTH CAROLINA CENTRAL UNIV. DURHAM	METHODS MEASURING EFFECTS OF CHEMICAL AQUATIC POLLUTANTS ON MOVEMENT, GROWTH&SURVIVAL OF PROTOZOA	MILLS, WILLIAM L.	80300902	CONT	75/10/24	$12,988
NORTH CAROLINA CENTRAL UNIV. DURHAM	EVALUATION OF THE MUTAGENIC POTENTIALS OF PLATINUM COMPOUNDS	SANDHU, SHABEG S.	80329902	CONT	75/10/24	$31,763
NORTH CAROLINA STATE UNIV. RALEIGH	MATHEMATICAL TECHNIQUES FOR X-RAY ANALYZERS	GARDNER, ROBIN P.	80275902	INCR	75/11/24	$8,050
NORTH CAROLINA, UNIV. OF CHAPEL HILL	OUTDOOR SIMULATION OF AIR POLLUTION CONTROL STRATEGIES	JEFFRIES, HARVEY	80091603	INCR	75/12/18	$10,250
NORTH CAROLINA, UNIV. OF CHAPEL HILL	EVALUATION TENTATIVE STANDARD METHODS FOR ENTERIC VIRUS CONCENTRATION & DETECTION IN DRINKING WATERS	SOBSEY, MARK D.	80421801	NEW	75/11/12	$74,302
** DEMONSTRATION **						
NORTH CAROLINA A&T STATE UNIV. GREENSBORO	REDUCING WASTEWATER FROM CUCUMBER PICKLING PROCESS BY CONTROLLED CULTURE FERMENTATION	HARRISON, ROBERT M.	80422001	NEW	75/09/08	$50,228
** TRAINING **						
NORTH CAROLINA, UNIV. OF CHAPEL HILL	GRADUATE TRAINING IN AIR POLLUTION	STERN, ARTHUR	90005305	INCR	75/09/16	$29,416
NORTH CAROLINA, UNIV. OF CHAPEL HILL	GRADUATE TRAINING WATER QUALITY ASSESSMENT	WEISS, C. M.	90012208	CONT	75/09/30	$35,809

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		NORTH CAROLINA				
** TRAINING **						
			90012208	INCR	75/12/11	$6,156
** FELLOWSHIPS **						
APPALACHIAN STATE UNIV. BOONE	M.A./POLITICAL SCIENCE	HEDGECOCK, EARLY A.	91070201	NEW	75/09/05	$1,145

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**** RESEARCH ****

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
CASE WESTERN RESERVE UNIV. CLEVELAND	DISPERSION & FATE OF HAZARDOUS MATERIALS IN THE GREAT LAKES	LICK, WILBERT	80370401	INCR	75/12/16	$31,579
CENTRAL STATE UNIV. WILBERFORCE	EVALUATION OF ION-SELECTIVE PROBES FOR WATER QUALITY CONTROL	SCHLUETER, ALBERT W.	80275502	CONT	75/11/24	$17,448
CINCINNATI, UNIV. OF CINCINNATI	PLANNING WATER SUPPLY-BUILDING PERMITS & COST/RATE DIFFERENTIALS	GODDARD, HAYNES C.	80359601	INCR	75/09/19	$3,790
CINCINNATI, UNIV. OF CINCINNATI	INVESTIGATION OF THE METABOLISM OF CHLORINATED HYDROCARBONS IN DRINKING WATER IN SUBHUMAN PRIMATES	SMITH, CARL C.	80396301	NEW	75/10/08	$73,429
CINCINNATI, UNIV. OF CINCINNATI	OCCURENCE&EFFECTS OF ORGANICS DRINKING WATER-MUTAGENIC&CARCINOGENIC EFFECTS OF METABOLIC ACTIVATION	LOPER, JOHN C.	80420201	NEW	75/12/11	$170,115
KENT STATE UNIV. KENT	MONITORING AND NUTRIENT INACTIVATION STUDIES ON TWO GLACIAL LAKES & NUTRIENT DIVERSION	COOKE, G. DENNIS	80193605	CONT	75/09/09	$43,813
NATIONAL WATER WELL ASSOC. COLUMBUS	CONSTRUCTION GUIDE OF SUBSURFACE INJECTION SYSTEMS & ABANDONMENT PROCEDURES	LEHR, JAY H.	80388901	INCR	75/10/24	$15,095
OHIO STATE UNIV RES FDN COLUMBUS	MAUMEE RIVER PILOT WATERSHED STUDY	SLOAN, KENNETH	00514501	INCR	75/08/28	$18,000
			00514501	INCR	75/12/23	$90,000
OHIO STATE UNIV. RES. FDN. COLUMBUS	MECHANISMS OF PHOTOCHEMICALLY INITIATED OXIDATIONS	CALVERT, JACK G.	80039815	INCR	75/11/07	$19,634

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APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** TRAINING **						
TOLEDO, UNIV. OF TOLEDO	WATER POLLUTION CONTROL TRAINING GRANT	BENNETT, GARY F.	90013208	CONT	75/09/25	$13,364
** FELLOWSHIPS **						
CINCINNATI, UNIV. OF CINCINNATI	M.S./ENVRN. ENGR.	COMAS MONTALVO, LUIS A	91070101	NEW	75/09/19	$6,500
CINCINNATI, UNIV. OF CINCINNATI	M.S./INDUSTRIAL HYGIENE	RICHARD, DANNY WILLIAM	91072601	NEW	75/12/18	$7,538

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	OKLAHOMA					
** RESEARCH **						
EAST CENTRAL OKLAHOMA STATE UNIV. ADA	A METHOD OF DISSEMINATION OF ANIMAL WASTE MANAGEMENT TECHNICAL INFORMATION	ROWE, M. L.	80145403	INCR	75/11/14	$2,500
EAST CENTRAL OKLAHOMA STATE UNIV. ADA	A METHOD FOR DISSEMINATION OF ANIMAL WASTE MANAGEMENT TECHNICAL INFORMATION	ROWE, M. L.	80145404	CONT	75/12/16	$39,446
OKLAHOMA, UNIV. OF NORMAN	ENERGY CONSERVATION THROUGH REDUCTION IN REFUSE	REID, GEORGE W.	80418301	NEW	75/09/12	$13,520
** TRAINING **						
OKLAHOMA STATE UNIV. STILLWATER	TRAINING IN WATER POLLUTION CONTROL (ENGR. SCIENCE; INTERDISCIPLINARY)	GAUDY, ANTHONY F.	90007806	INCR	75/09/23	$40,026

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	O R E G O N					
** RESEARCH **						
OREGON DEPT. OF FISH & WILDLIFE CORVALLIS	EFFECTS OF METALS & HERBICIDES ON MIGRATION & SEAWATER ADAPTATION OF JUVENILE COHO SALMON	LORZ, H. W.	80428301	NEW	75/12/24	$67,691
OREGON STATE UNIV. CORVALLIS	ABSORPTION & DISTRIBUTION OF LOW LEVELS OF CADMIUM-A COMPARISON BETWEEN WATER & FOOD	TINSLEY, IAN J.	80342302	CONT	75/11/03	$25,000
OREGON STATE UNIV. CORVALLIS	EFFECTS OF ENVIRONMENTAL CONTAMINANTS ON CELL-MEDIATED IMMUNITY	KOLLER, LOREN D.	80420001	NEW	75/11/06	$59,686
** TRAINING **						
OREGON STATE UNIV. CORVALLIS	GRADUATE TRAINING IN WATER QUALITY	SCHAUMBURG, FRANK D.	90007208	CONT	75/09/26	$39,303

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	P E N N S Y L V A N I A					
** RESEARCH **						
PENNSYLVANIA DEPT. OF ENVRN. RESOURCES HARRISBURG	FEASIBILITY STUDY OF JOINT REGIONAL INDUSTRIAL WASTE TREATMENT FACILITY	SCHOENER, KENNETH E.	80418201	NEW	75/11/06	$129,115
PENNSYLVANIA STATE UNIV. UNIVERSITY PARK	SELECT RESEARCH GROUP IN AIR POLLUTION METEOROLOGY	THOMPSON, DENNIS W.	80039704	CONT	75/09/30	$403,000
PENNSYLVANIA STATE UNIV. UNIVERSITY PARK	REACTIONS IN POLLUTED ATMOSPHERES	HEICKLEN, JULIAN P.	80087404	INCR	75/11/03	$6,000
PENNSYLVANIA STATE UNIV. UNIVERSITY PARK	REACTIONS IN POLLUTED ATMOSPHERES	HEICKLEN, JULIAN P.	80087405	CONT	75/12/09	$40,000
PITTSBURGH, UNIV. OF PITTSBURGH	PERFORMANCE EVALUATION OF LAGOON SYSTEM AT WINDBER, PENNSYLVANIA	EARNEST, CHARLES M.	80397501	INCR	75/10/06	$44,216
PITTSBURGH, UNIV. OF PITTSBURGH	SAFETY EVALUATION OF RENOVATED WASTEWATER	ANDELMAN, JULIAN B.	80428601	NEW	75/11/14	$112,838
** TRAINING **						
PENNSYLVANIA STATE UNIV. UNIVERSITY PARK	GRADUATE AIR POLLUTION TRAINING PROGRAM	MOROZ, WILLIAM J.	90053701	INCR	75/12/18	$4,460
** FELLOWSHIPS **						
PENNSYLVANIA STATE UNIV. UNIVERSITY PARK	M.S./ENVRN. POLLUTION CONTROL	RICHARDS, ALLAN F.	91069501	NEW	75/12/18	$9,810

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	R H O D E I S L A N D					
** RESEARCH **						
RHODE ISLAND, UNIV. OF KINGSTON	MAMMALIAN CELL CULTURE ASSAYS OF TOXIC SUBSTANCES	FISHER, HAROLD W.	80137902	INCR	75/09/04	$2,000
RHODE ISLAND, UNIV. OF KINGSTON	PETROLEUM HYDROCARBONS IN DREDGE SPOIL	QUINN, JAMES G.	80341502	CONT	75/10/03	$17,693
RHODE ISLAND, UNIV. OF KINGSTON	A FACILITY FOR THE EXPERIMENTAL ANALYSIS OF COASTAL MARINE ECOSYSTEMS	KNAUSS, JOHN A.	80390201	NEW	75/11/04	$975,955
RHODE ISLAND, UNIV. OF KINGSTON	DEVELOPMENT OF A METHOD FOR STABILIZING INDICATOR BACTERIA IN WATER SAMPLES	WOOD, NORRIS P.	80396701	NEW	75/11/24	$14,500
RHODE ISLAND, UNIV. OF KINGSTON	A STANDARD PROGRAM FOR ENVIRONMENTAL IMPACT ASSESSMENT: PHASE 1 ICHTHYOPLANKTON SAMPLING	SAILA, SAUL B.	80421601	NEW	75/11/14	$64,982
** TRAINING **						
RHODE ISLAND DEPT OF HEALTH PROVIDENCE	WWT PLANT OPER. TRAIN. COURSE	JOSEPH E. CANNON, M.D.	00107801	NEW	75/12/03	$9,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	SOUTH CAROLINA					
** RESEARCH **						
CLEMSON UNIV. CLEMSON	DETERMINATION OF BREEDING SITES & EFFECTS OF NEMATODES IN DRINKING WATER TREATMENT FACILITY	TOMBES, A. S.	80429201	NEW	75/12/31	$42,473
SOUTH CAROLINA DEPT. OF HEALTH & ENVRN COLUMBIA	SOUTH CAROLINA OVERLAND FLOW PROJECT	PATE, JOHN B.	80392901	NEW	75/11/06	$219,000
			80392901	INCR	75/12/02	$74,778
SOUTH CAROLINA, UNIV. OF COLUMBIA	CRITERIA FOR ESTABLISHMENT OF STANDARD BIOASSAY METHODS IN CRUSTACEAN LARVAE USING FLOW-THRU SYSTEM	VERNBERG, W. B.	80287103	CONT	75/12/03	$33,980
SOUTH CAROLINA, UNIV. OF COLUMBIA	DYNAMICS OF ESTUARY AS NATURAL ECOSYSTEM	VERNBERG, F. J.	80292802	INCR	75/10/02	$36,308
** TRAINING **						
CLEMSON UNIV. CLEMSON	INTERDISCIPLINARY EDUCATION IN ENVIRONMENTAL SYSTEMS ENGINEERING	RICH, LINVIL G.	90014607	INCR	75/09/04	$35,000
SC STATE BD FOR TECH & COM ED. COLUMBIA	AIR POLLUTION MANPOWER TRAINING GRANT - AUTO EMISSIONS CONTROL PROJECT	VICTOR J SAMPSON	00416201	NEW	75/09/16	$30,000
** FELLOWSHIPS **						
SOUTH CAROLINA, UNIV. OF COLUMBIA	M.S./PUBLIC ADMIN.	MCCULLOUGH, LARRY E.	91066701	INCR	75/11/12	$1,475
SOUTH CAROLINA, UNIV. OF COLUMBIA	M.S./ENGR.	PEARSON, OTTO E.	91072401	NEW	75/12/23	$730

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	SOUTH DAKOTA					
** RESEARCH **						
SOUTH DAKOTA SCHOOL OF MINES & TECH. RAPID CITY	A CASE STUDY OF FORMATION AND REMOVAL OF HYDROCARBONS IN DRINKING WATER	DR. LELAND HARMS	00812801	NEW	75/08/08	$31,302

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
TENNESSEE						
** RESEARCH **						
MEHARRY MEDICAL COLLEGE NASHVILLE	EFFECT OF LEAD ON GAMMA-AMINO BUTYRIC ACID SYNTHESIS	MOSES, HENRY A.	80237003	CONT	75/10/31	$28,814
** TRAINING **						
TENNESSEE DEPT. OF PUBLIC HEALTH NASHVILLE	SOLID WASTE TRAINING GRANT	MR. TOM TIESLER	00416901	NEW	75/12/05	$5,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	T E X A S					
** RESEARCH **						
TEXAS A&M RES. FDN. COLLEGE STATION	STRUCTURE & REACTIVITY OF ABSORBED OXIDES OF SULFUR	LUNSFORD, JACK H.	80113606	CONT	75/12/22	$33,000
TEXAS A&M RES. FDN. COLLEGE STATION	ACCUMULATION & PASSAGE OF POLLUTANTS IN DOMESTIC SEPTIC TANK DISPOSAL FIELDS	BROWN, KIRK W.	80295502	INCR	75/11/24	$38,370
TEXAS A&M RES. FDN. COLLEGE STATION	THE CALIBRATION OF OZONE SAMPLING BY IODOMETRIC ANALYSES	BENSON, FRED J.	80340302	CONT	75/10/03	$30,000
TEXAS TECH. UNIV. LUBBOCK	CONFERENCE ON MANAGING SALINE WATERS FOR IRRIGATION: PLANNING FOR THE FUTURE	DREGNE, HAROLD E.	80426501	NEW	75/10/24	$12,282
TEXAS, UNIV. OF AUSTIN	BIOLOGICAL COUNTERMEASURES TO MITIGATE THE EFFECTS OF HAZARDOUS MATERIALS SPILLS	ARMSTRONG, NEAL E.	80220701	INCR	75/11/06	$32,828
TEXAS, UNIV. OF AUSTIN	CHARACTERIZATION OF SHRIMP BACULOVIRUS	SUMMERS, MAX D.	80339502	CONT	75/09/19	$43,475
			80339502	INCR	75/12/11	$8,000
** TRAINING **						
NORTH TEXAS STATE UNIV. DENTON	TRAINING IN WATER SUPPLY, QUALITY & POLLUTION CONTROL	SILVEY, J. K. G.	90011504	INCR	75/09/05	$39,484
TEXAS A&M UNIV. COLLEGE STATION	TRAINING IN WASTEWATER TREATMENT & AQUATIC SYSTEM MANAGEMENT	HANN, ROY W.	90012904	CONT	75/10/21	$19,883
TEXAS, UNIV. OF AUSTIN	TRAINING IN WATER SUPPLY AND POLLUTION CONTROL	MALINA, JOSEPH	90010708	CONT	75/09/30	$22,450

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
T E X A S						
** TRAINING **						
TEXAS, UNIVERSITY OF, AT ARLINGTON ARLINGTON	TRAINING FOR MUNI OF FICIALS ON ENVIRONMENTAL ASSESSMENTS	DR WH NEDDERMAN, PRESI	00612001	NEW	75/11/03	$9,476
TEXAS, UNIVERSITY OF, AT DALLAS RICHARDSON	TRAINING - COG/208 PERSONNEL	DR PATRICK L ODELL	00611801	NEW	75/09/11	$16,070
** FELLOWSHIPS **						
TEXAS, UNIV. OF AUSTIN	PH.D./CHEMICAL ENGR.	YOM, KERRY SOO	91069801	NEW	75/12/16	$1,643
TEXAS, UNIV. OF AUSTIN	M.S./CHEMICAL ENGR.	BILSKY, IRVIN-LEE	91070601	NEW	75/10/29	$700
TEXAS, UNIV. OF AUSTIN	M.S./ENVIRONMENTAL HEALTH ENGINEERING	PENDLETON, D. R.	91070901	NEW	75/10/24	$700
TEXAS, UNIV. OF AUSTIN	M.S./ENVIRONMENTAL HEALTH ENGINEERING	MAGEE, M. L.	91071001	NEW	75/10/29	$700
TEXAS, UNIV. OF AUSTIN	M.S./ENVRN. HEALTH ENGR.	DURRENBERGER, CYRIL J.	91071101	NEW	75/10/24	$674
TEXAS, UNIV. OF AUSTIN	M.S./ENVRN. HEALTH ENGR.	DATTNER, STUART L.	91071201	NEW	75/10/29	$674
TEXAS, UNIV. OF AUSTIN	M.S./ENVRN. HEALTH ENGR.	DUBOSE, WALTER H.	91071301	NEW	75/10/22	$674
TEXAS, UNIV. OF AUSTIN	M.S./ENVRN. HEALTH ENGR.	CUNNINGHAM, JAMES E.	91071401	NEW	75/10/16	$674

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	TEXAS					
** FELLOWSHIPS **						
TEXAS, UNIV. OF AUSTIN	M.S./ENVRN. HEALTH ENGR.	LEE, RICHARD P.	91071501	NEW	75/10/22	$674
TEXAS, UNIV. OF AUSTIN	M.S./ENVRN. HEALTH ENGR.	SCHRAUFNAGEL, PATRICIA	91071701	NEW	75/10/22	$674

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	U T A H					
** RESEARCH **						
UTAH, UNIV. OF SALT LAKE CITY	ANALYSIS OF AMBIENT AIR QUALITY DATA	DE NEVERS, NOEL	80310401	INCR	75/12/23	$6,218
** DEMONSTRATION **						
UTAH STATE DIVISION OF HEALTH SALT LAKE CITY	UTAH STATE SOLID WASTE DEMONSTRATION GRANT	LYMAN J. OLSEN	00811801	NEW	75/09/03	$33,000
** FELLOWSHIPS **						
UTAH STATE UNIV. LOGAN	M.S./ENGR.	THOMAS, WAYNE S.	91063101	INCR	75/11/14	$200

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	VERMONT					
** TRAINING **						
VERMONT AGCY OF ENVRN CONSERV MONTPELIER	WWT PLANT OPER. TRAIN. COURSE	GORDON R. PYPER	00108201	NEW	75/12/03	$9,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	V I R G I N I A					
** RESEARCH **						
HAMPTON INST. HAMPTON	MATRIX-ISOLATION STUDIES INVOLVING THE OXIDATION OF SULFUR DIOXIDE	HUNTER, CHARLES	80351601	INCR	75/12/09	$5,700
VIRGINIA INST. OF MARINE SCIENCE GLOUCESTER POINT	SUBLETHAL EFFECTS OF CHLORINE ON MARINE VASCULAR PLANTS & DECAPOD CRUSTACEANS	ROBERTS, MORRIS H.	80387201	INCR	75/12/09	$9,000
VIRGINIA INST. OF MARINE SCIENCE GLOUCESTER PT.	ASSESSMENT OF APPLICATION OF MULTIVARIATE ANALYSES IN ECOLOGICAL INVESTIGATIONS OF WATER POLLUTION	BOESCH, DONALD F.	80412701	NEW	75/10/24	$80,031
VIRGINIA INST. OF MARINE SCIENCE GLOUCESTER PT.	SAMPLING OF PHYTOPLANKTON & ZOOPLANKTON IN QUANTITATIVE BASELINE & MONITORING PROGRAMS	GRANT, GEORGE C.	80414701	NEW	75/11/03	$14,848
VIRGINIA MEDICAL COLLEGE RICHMOND	EFFECTS OF SELECTED ORGANIC WATER CONTAMINANTS ON MALE REPRODUCTIVE FUNCTION	BORZELLECA, JOSEPH F.	80429001	NEW	75/12/16	$75,892
VIRGINIA MEDICAL COLLEGE RICHMOND	THE EXCRETION OF PESTICIDES IN SALIVA	BORZELLECA, JOSEPH F.	80431801	NEW	75/12/31	$46,132
VIRGINIA STATE COLLEGE PETERSBURG	STUDY OF EFFECTS OF PESTICIDES ON DEVELOPMENT OF ALGAE	WOODSON, BERNARD R.	80238803	CONT	75/10/29	$30,052
** TRAINING **						
VIRGINIA POLY. INST. & STATE UNIV. BLACKSBURG	WATER RESOURCES MANAGEMENT & QUALITY CONTROL	KING, PAUL H.	90033308	CONT	75/09/29	$45,855
** FELLOWSHIPS **						
VIRGINIA POLY. INST. & STATE UNIV. BLACKSBURG	M.S./ENVRN. SCIENCE & ENGR.	ELKIN, THEODORE	91069901	NEW	75/09/26	$4,556

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	W A S H I N G T O N					
** RESEARCH **						
VIRGINIA MASON RES. CTR. SEATTLE	CONTINUOUS MONITORING OF DISSOLVED GAS PRESSURE	D'ADUST, BRIAN G.	80417501	NEW	75/11/20	$28,134
WASHINGTON STATE UNIV. PULLMAN	NATURAL HYDROCARBONS IN PHOTOCHEMICALS IN AIR POLLUTION	WESTBERG, H.H.	80067005	CONT	75/12/04	$35,000
WASHINGTON STATE UNIV. PULLMAN	MEASUREMENT OF TROPOSPHERIC HALOCARBONS BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY	RASMUSSEN, REINHOLD A.	80403301	NEW	75/10/29	$19,582
WASHINGTON, UNIV. OF SEATTLE	OPTICAL EFFECTS OF ATMOSPHERIC AEROSOL	WAGGONER, ALAN	80066511	INCR	75/09/12	$20,000
			80066511	INCR	75/11/17	$40,426
** TRAINING **						
WASHINGTON, UNIV. OF SEATTLE	RESEARCH TRAINING & PROFESSIONAL DEVELOPMENT APPLIED TO STATE NEEDS	SYLVESTER, ROBERT O.	90031305	CONT	75/09/29	$53,574
** FELLOWSHIPS **						
WASHINGTON STATE UNIV. PULLMAN	M.S./ENVRN. ENGR.	YAKE, WILLIAM F.	91058801	INCR	75/12/05	$180

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
W E S T V I R G I N I A						
** TRAINING **						
WEST VIRGINIA, UNIV. OF MORGANTOWN	AIR POLLUTION CONTROL TRAINING PROGRAM	LINSKY, BENJAMIN	90056701	NEW	75/11/03	$54,700
** FELLOWSHIPS **						
WEST VIRGINIA COLLEGE GRADUATE STUDIES INSTITUTE	M.S./ENVRN. ENGR.	EVANS, RANDOLPH M.	91073301	NEW	75/12/23	$744
WEST VIRGINIA COLLEGE GRADUATE STUDIES INSTITUTE	M.S./ENVRN. ENGR.	BEANE, RICHARD A.	91073401	NEW	75/12/17	$744

W I S C O N S I N

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
INSTITUTE OF PAPER CHEMISTRY APPLETON	COMBINED MEMBRANE AND FREEZING CONCENTRATION OF BLEACHING RECYCLE WATERS	WILEY, AVERILL J.	80352501	INCR	75/11/04	$50,000
WISCONSIN DNR MADISON	MENOMINEE RIVER PILOT WATERSHED STUDY	KONARD, JOHN	00514201	INCR	75/08/29	$208,000
			00514201	INCR	75/12/23	$416,000
WISCONSIN UNIV OF MADISON	CHEMICAL EFFECTS OF RED CLAY ON WESTERN LAKE SUPERIOR	BARNICK, DONALD A.	00516901	INCR	75/08/29	$9,915
WISCONSIN, UNIV. OF MADISON	SMALL SCALE WASTE MANAGEMENT	BOYLE, WILLIAM C.	80287403	CONT	75/11/24	$138,000
WISCONSIN, UNIV. OF MADISON	EMISSION FORMATION IN HETEROGENEOUS COMBUSTION	BORMAN, GARY	80385801	NEW	75/10/08	$49,090
WISCONSIN, UNIV. OF MADISON	INFECTIVITY & PATHOGENICITY OF ENTEROVIRUSES INGESTED WITH DRINKING WATER	CLIVER, DEAN O.	80398601	NEW	75/09/19	$58,691
WISCONSIN, UNIV. OF MADISON	HUMAN HEALTH HAZARDS OF VIRUSES IN DRINKING & RECREATIONAL WATERS	D'ALESSIO, DONN J.	80416101	NEW	75/12/30	$97,393
WISCONSIN, UNIV. OF MADISON	ION EXCHANGE MEMBRANES APPLIED NEW METHODS OF SAMPLING ENRICHMENT & SPECIFICATION IN WATER ANALYSIS	BLAEDEL, WALTER J.	80417901	NEW	75/09/19	$32,476

** DEMONSTRATION **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
PEWAUKEE, VILL OF PEWAUKEE	DEMONSTRATION OF PHOSPHORUS REMOVAL & PERFORMANCE UPGRADING ON MUNICIPAL RBC WWT PLANT	KLUGE, DAVID L.	80290501	INCR	75/11/04	$15,100

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		W I S C O N S I N				
** TRAINING **						
MARQUETTE UNIV. MILWAUKEE	TRAINING IN WATER POLLUTION CONTROL & ENVIRONMENTAL ENGINEERING	KIPP, RAYMOND J.	90001409	CONT	75/09/29	$32,771
WISCONSIN, UNIV. OF MADISON	PROFESSIONAL TRAINING IN ANALYSIS & DESIGN OF WATER SUPPLY & POLLUTION CONTROL SYSTEMS	POLKOWSKI, LAWRENCE B.	90016605	CONT	75/09/29	$20,958

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	F O R E I G N C O U N T R I E S GERMANY					
** RESEARCH **						
INST.AEROBIOLOGIE FRAUNHOFER-GESELLSCH SAUERLAND	DESIGN & PERFORMANCE OF AN AEROSOL MASS DISTRIBUTION MONITOR	STOBER, WERNER	80359201	NEW	75/11/17	$34,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	FOREIGN COUNTRIES ISRAEL					
** RESEARCH **						
HEBREW UNIV. JERUSALEM	DEVELOPMENT OF METHODS FOR DETECTION & INACTIVATION OF VIRUSES IN VARIOUS WATERS	SHUVAL, H.I.	80351001	INCR	75/10/08	$24,804

SECTION II

ABSTRACTS (NRP's)FOR THE RESEARCH & DEMONSTRATION PROJECTS LISTED IN SECTION I.

71

R-800042-

a) To establish optimal levels of filter properties in terms of filtration performance and to develop nonwoven fabrics as filter media for the removal of air borne particulate matter in the respirable dust range.

b) To establish the effectiveness of experimental nonwoven fabrics as filter media in practical situation by examining the performance of filter bags in extended trials.

800170

We shall conduct a systematic study and expose 3 and 6 weeks old cotton and soybean seedlings to 0.1, 0.5, 1.0, 5.0, and 50 ppm of NO_2 and SO_2, both singly and in combination. The seedlings will be fumigated for a period of 2, 4, and 8 hours per day for 5-7 days. Check plants shall be placed inside the chamber for the requisite period of time and ambient air shall be circulated. Following a 24-hour recovery period, the seedlings shall be used for the following specific studies:

1) Seedling growth and development,
2) Protein, RNA and DNA syntheses, and
3) Enzyme systems.

800 397

The Select Research Group (SRG) is developing a comprehensive air pollution model designed to enable a control agency to relate air pollution sources to their subsequent distribution in an urban or regional environment. Because progress towards the principal objective requires a broad interdisciplinary effort, the research program has been organized around several integrated subtasks. These include: development of a hydrodynamic model for predicting on a regional basis atmospheric winds and other air pollution-influencing meteorological variables; studies of techniques for modeling atmospheric processes which occur on scales smaller that those evaluated directly by the regional model; development of a closure scheme for the prediction of turbulent fluxes of pollutants; improvement of techniques for remotely sensing and directly measuring meteorological and air pollution parameters in order that the performance of the regional model can be adequately tested and evaluated; studies of the meteorological effects on the properties of air pollutants and pollutant-pollutant interactions; and studies of the removal of air pollutants at the earth's surface.

Significant research completed during the first year of the SRG program included: completion of coding and inititation of testing of the regional numerical model, development and testing of a comprehensive meteorological-air pollution aircraft measurement system, and the design and initial testing of an acousitc sounding system. Aerosol studies have focused on the development and integration of measurement techniques suitable for determining the temporal and spatial variations of both non-hygroscopic and hydroscopic particulates. Special urban, city and rural measurements of atmospheric aerosol using both surface and airborne techniques have been conducted and are being analyzed.

800 398

"Mechanisms of Photochemically Initiated Oxidations."

Elucidation of chemical reactions which occur in the various urban atmospheres; characterization of reactive intermediates and transients formed thereby; and to test possible models of such in real atmosphere using computer techniques.

800426

Research related to the quality of irrigation return flow is being carried out at 35 different institutions throughout the 17 Western United States. Related work is also underway at institutions in the Eastern U.S., Canada, Israel and other areas throughout the world. The results of this research are reported in approximately 100 periodicals including experiment station bulletins, technical reports, magazines, and proceedings and journals of professional societies. The objectives of this project are:

1. To pull together published results from related research efforts and make these available to others in the field.
2. To maintain a current summary of irrigation return flow literature within the files of the Water Resources Scientific Information Center EDP facility.
3. To identify gaps in the collective effort and stimulate research to fill these gaps.
4. To promote (and assist in) application of research results to the solution of water pollution problems.

To meet these objectives, a selected list of 100 publications will be reviewed, and articles pertaining to irrigation return flow quality will be abstracted. Abstracts and copies of the articles abstracted will be provided to the Water Resources Scientific Information Center (WRSIC) and to the EPA laboratory at Ada, Oklahoma. Project will begin October 1, 1973 and be completed September 30, 1979.

R800637

We propose to study interactions in the metabolism of chlorinated hydrocarbons and hormonal steroids in order to more clearly define the nature of the interactions and their potential for influencing population dynamics. The methodology developed for one species, the rat, and one pesticide, DDT, will be applicable for testing other species and other chlorinated hydrocarbons.

Initial experiments will compare the abilities of excised liver, adrenal and gonadal tissues of DDT-treated and untreated rats to metabolize testosterone and DDT. Variation of the steroid substrate and adjustment of pesticide dosage will allow delineation of the sites of DDT action and their relative sensitivities. Concurrent measurements of blood and urinary levels of steroids will be done to test for compensatory responses to altered steroid degradation. Steroids and pesticides and their metabolic products will be measured by gas chromatography, thin-layer chromatography and isotope dilution techniques.

R 800649 17

Our smog chamber and laboratory studies continue to provide data necessary for the development of experimentally validated kinetic computer models chemical and physical transformations in polluted atmospheres, which can be incorporated into urban airshed models. The latter are used in developing and evaluating emission control strategies and health warning systems for photochemical air pollution.

Specifically, the SAPRC smog chamber facility continues to be used in an experimental program designed to provide accurate and extensive data for computer model validation. Thus, the photochemistry program conducted in the 5800 liter evacuable chamber includes the irradiation under simulated atmospheric conditions of NO -hydrocarbon systems in the pphm-ppm range beginning with a single hydrocarbon and building through systems of six-component hydrocarbon mixtures of alkenes, alkanes and aromatics. Studies of the effects of aldehydes on these systems is included. A Fourier interferometer long-path infrared (LPIR) system has been installed and tested. It will be routinely used to detect and monitor species not previoulsly analyzed such as nitrous, nitric and formic acid, and hydrogen peroxide. An off-line combined gas chromatograph-mass spectrometer system will be used for the characterization of additional trace products.

The laboratory program will continue to provide detailed product, mechanistic and kinetic data that will support the chamber experiments and lead to the development of more accurate computer models. The major focus in the laboratory studies this year will be a quantitative investigation of the products formed in the reactions of OH radicals with benzene, toluene, and possibly other selected aromatics in the presence of oxygen, and at atmospheric pressure.

R 800665

This research will continue investigation of the effect of atmospheric aerosol properties on visibility through parallel studies in several directly related areas. Activities to date include development of the integrating nephelometer and studies with it relating visibility to mass concentration, wavelength dependence of light scattering, spatial distribution of aerosol, humidity, and aerosol chemical composition. Instrument development has recently been completed in the last two areas and field experimentation will continue relating chemical composition of aerosols to their *in situ* physical and optical response to increased humidity. We will continue with analysis of data collected during the fall, 1972, California experiment during which we measured the listed aerosol parameter and other groups measured aerosol size distribution, atmospheric trace gas content, meteorological parameters, etc.

We will participate in a similar joing experiment in St. Louis in August and September of this year. Our experimental goal is to gain further understanding of the interrelationship of 1) the amount, composition and size distribution, 2) the role of water, 3) optical properties of the atmospheric aerosol.

The past four years of research have practical significance based on both technical and scientific results. An integrating nephelometer based on our drawings and patents is being manufactured and is used widely both in scientific research and monitoring visibility degradation. An analog computer circuit that calculates relative humidity from temperature and dew point has been developed for use in our humidity research. New sample collecting and data processing techniques developed in this group allow identification of molecular components in urban smog. These techniques having been proven in the laboratory will now be applied to the urban environment. It is vital to have this broad spectrum approach to obtain a useful description of the causes of visibility degradation.

800670

A study to obtain experimental evidence that defines and explains the contribution of natural organic emissions to the photochemical oxidant concentrations observed in problem areas--nonurban and urban. The aim of the first phase of the project is to determine through systematic laboratory experiments the ozone yield in the reaction of NO_x with different terpenes and other natural hydrocarbons for varied HC/NO_x ratios. The second year's objective extends the research into an area of more sophisticated interest as it regards the identification of the type of intermediate and final products formed in the terpene oxidation reaction. There is evidence to suggest that these reaction products are very active precursors initiating photochemical ozone formation.

800708

A birefringent correlation filter optical device for measuring the concentration of a particular pollutant has been built. This device measures the absorption of light from a light beam due to the presence of a particular molecule.

The original instrument is sensitive to NO_2. This project will (a) further field test the instrument for NO_2, (b) modify the instrument to measure SO_2, (c) laboratory test the SO_2 instrument and (d) field test the SO_2 instrument.

800771

This research work is designed to develop an analytical procedure for the direct and continuous determination of metals in air. Procedures have been developed for Pb, Hg, Cd, As. Absorption signals for Cu, Zn, Na, K, Se have been observed but have not been calibrated as yet.

Based on the data we have obtained the current grant proposes to: (a) develop a calibration procedure for an atomic absorption instrument valid to concentrations of 10^{-13} g or 0.001 $\mu g/m^3$ of air; (b) develop a method for the direct determination of metals in molecular form and in particulates, measuring the total concentration of a particular pollutant. By adding suitable filters, the particulates can be removed from the air. Analysis of filtered air would provide the concentration of the remaining pollutants (molecular pollutants). The difference in two results should be the concentration metal in the particulate removed by filtering. Metals of interest include Pb, Hg, Cd, Se, As, Ni, Cr, B, Cu, Zn, and Sb.

R800874

It is our objective to study chemical reactions of importance in polluted urban atmospheres so that the products, mechanisms, and rates of those reactions can be determined. Steady-state laboratory photolytic techniques are used. Reaction mixtures are irradiated with controlled light sources, and the products of the reaction are monitored continually by mass and infrared spectroscopy. After the irradiation is terminated, a gas chromatographic analysis is made.

During the past year we have studied the following systems:

1. The reaction of HO with C_2H_4
2. The photooxidation of 2-bromoethanol
3. The oxidation of CH_3CO radicals
4. The photooxidation of CH_3CHO
5. The oxidation of HCO radicals
6. The reaction of O_3 with CH_2O
7. The photooxidation of CH_2O
8. The reactions of HO with NO and NO_2, and the reaction of HO with NO

In the coming year we intend to complete our study of HO radicals with C_2H_4 and extend the study of HO radicals to C_3H_6 and C_2H_3Cl. Since the HO-C_2H_4 study indicated that C_2H_4OH and C_2H_3 radicals are produced we intend to study their oxidation also.

We intend to look at the reactions of peroxyacetyl radicals with NO, NO_2, CO, and SO_2 to see if the radical can act as an oxidizing agent. In particular the reaction with NO_2 should produce peroxyacetyl nitrate (PAN), and we hope to study this reaction in depth.

Finally we will study the reactions of HO_2 with NO_2 to determine the relative efficiency of HONO and HO_2NO_2 production, as well as rate coefficients for HO_2NO_2 decomposition to give $HO_2 + NO_2$ or $HONO + O_2$. The reaction of CH_3O_2 with NO relative to the self annihilation of $2CH_3O_2$ radicals will be examined by monitoring NO disappearance by chemiluminescent techniques.

R 800881

Alvelor wall cells which are strongly lactate dehydrogenase (LDH) positive can be counted and compared to the numbers of alveoli that contain them, providing an LDH cell/alveolus Index. An increase in the Index has been found in experiments where guinea pigs have been exposed to nitrogen dioxide at levels of 15 ppm to a low of 2 ppm. A major contributor to the increase in LDH positive wall cells is the Type II Pneumocyte; the extent of the histiocyte hyperplasia also present has not yet been determined. Both of the latter cell types are well known to undergo early and prominent hyperplasia in a large number of disorders where the lung is damaged or diseased. The meaning of the hyperplasia in response to air pollution exposure and the sensitivity of the Index in detecting hyperplasia in respect to ambient levels of air pollutants are major goals of the proposed study. A special concern is whether Type I Pneumocyte damage and loss is an underlying factor to the Type II cell hyperplasia. The electronmicroscopy study will investigate this and other questions raised as to the changes occuring in the microecology of the lung at the cellular and subcellular levels. In accordance with the recent finding that the Index of the upper lobe is consistently higher than that of the lower lobe, the Index will be a means seeking out further localization of lung vulnerability and sites of damage where an ultrasturctural search will be most rewarding. Additional insight will be gained from pathophysiologic studies, including alveolar protein leakage in the lung, changes in hydrolase activity and shifts in diphosphoglycerate content of red blood cells. The ultimate goal is to provide quantitative biologic data useful for the establishment of air quality control.

R800916

The research program at the UNC outdoor smog chamber for the period of 1975-1976-1977 will concentrate on experimental simulations of control strategies for ozone (O_3). Experimental runs will, in stages of increasing complexity, simulate the chemical and physical processes that might be typical of a moving air parcel in the Los Angeles basin. The light intensity (natural solar radiation), air temperature, and relative humidity used in the simulation will be the ambient conditions existing at the time of a run. Injected material will consist of various combinations of nitric oxide (NO), nitrogen dioxide (NO_2), O_3, and a variety of hydrocarbons to include propylene (C_3H_6) only, simple mixtures of C_3H_6, butane (C_4H_{10}), and ethylene (C_2H_4), the previous urban hydrocarbon mix (13 or more compounds), and, if necessary, a more complex mix based on Mayrsohn's recent findings (1975) which would be composed of an auto exhaust fraction, a gasoline fraction, an evaporative emissions fraction and three types of natural gas fractions. In selected cases, the effects of mixing "old" air containing aldehydes and O_3 with the fresh reaction mixture will be examined. One or more Los Angeles Reactive Pollutant Program operations will be simulated in the outdoor chamber as a means of validating the chamber performance.

801112

The objectives of this study are to determine the magnitude of, and mechanisms for the release of potentially toxic or environmentally deleterious materials from dredge spoil during open-water disposal in large lake systems, with particular reference to the Great Lakes. The effects of such parameters as redox potential, dissolved oxygen, pH, particle size distribution, cation exchange capacity, exchangeable cation status and the like on the release of organic and inorganic chemicals from typical dredged material collected from rivers and harbors of the Great Lakes are being investigated. Release has been studied under controlled laboratory conditions in order to assess the role of each of the aforementioned parameters. Plans are to field test the conclusions drawn from the laboratory experiments during actual dredging operations.

R801136

The overall objective of this research is to determine the structure and reactivity of adsorbed oxides of sulfur. Results from such a study will be useful in identifying the photochemical and thermal reactions which take place on atmospheric aerosols. The specific goals during the current year were (a) to develop photoelectron infrared spectroscopy as a technique for studying oxides of sulfur on aerosols, (b) to determine the mechanism for the oxidation of SO_2 to $SO_4^=$ on surfaces. (c) to identify ions such as S_2O^- and H_2S^- which may be produced during the photochemical reaction of H_2S with SO_2 on magnesium oxide. Emphasis in future work will be placed on the catalytic oxidation of SO_2 in films of absorbed water.

801 301

This paper describes a new experimental technique for measuring the efficiency of filters. The technique is based on the use of monodisperse aerosols and a new electrical aerosol detector. In this paper, the technique is applied to the study of several commonly used membrane and Nuclepore filters. Results are obtained on the efficiency of these filters in the 0.02 to 1 um particle diameter range and at filter pressure drops of 1 to 30 cm Hg.

The filters tested here include Nuclepore filters of 0.6, 1.0, 3.0, 5.0 and 8.0 um diameter pores and Teflon membrane filters of 0.5, 1.0. 5.0 and 10.0 diameter pores. Minimum efficiencies for the Nuclepore filters were found to range from a low of zero for the 8 um filter to a high of 80% for the 0.6 um filter. For the Teflon membrane filters, minimum efficiencies ranged from 62% for the 10 um filter to a high of greater than 99.99% for the 0.5 and 1.0 um filters. In general, the membrane filter was found to be considerably more efficient than Nuclepore filter of the same or a comparable pore size.

The results obtained here indicate that the mechanisms of interception, impaction and diffusion are operative in these filters. In particular, the existence of a most penetrating particle size based on the operation of these filtration mechanisms has been experimentally observed for several of the filters tested. For the 0.6 and 1.0 um Nuclepore filter, the most penetrating size ranged from 0.03um to 0.15um. Further, the most penetrating size was found to decrease with increasing pressure drop across the filter as predicted by the classical theory based on these filtration mechanisms.

R801454

The objective of this project is to aid in the dissemination and technological transfer of information on the management of animal wastes throughout the livestock industry. Journals, books, theses, reports, and published and unpublished papers are searched for pertinent information. Once identified, these materials are abstracted and included in an annually published bibliography. Water-related publications that are abstracted are also submitted to Water Resources Scientific Information Center for publication in Selected Water Resources Abstracts.

801936

There are two main objectives to the Twin Lakes Project: (1) To assess the effect of sewage diversion on nutrient loading and the degree of eutrophication of these shallow ($\bar{z} = 4.5$ M), glacial, urban lakes, and (2) To treat one of the lakes with aluminum sulfate, as a lake restorative procedure, leaving one lake as a control. The lakes have become borderline mesotrophic since diversion in 1972, based on indicators related to plankton. Macrophyte productivity however equals plankton productivity. Alum dose and application methodology have been established, and a pilot lake (Dollar Lake) treatment was made in 1974. Phosphorus levels in the treated lake were significantly reduced and have remained low during autumnal and vernal circulation. West Twin Lake will be treated in 1975.

R802 132

The transport of heavy metals in aerosols will be investigated in the St. Louis, Missouri area by means of sample collection on filters and in cascade impactors, chemical analysis by sensitive nuclear methods of neutron activation and X-ray fluorescence, and correlation with sample location, particle size distribution, time variation during changing meteorological conditions, proximity to major sources, altitude of sampling, and the occurrence of rain and fog. The relative importance of natural terrestrial and marine sources and urban or industrial pollution sources will be compared for each element, as well as the effect of source processes on particle size distribution The study should lead to improving our prediction capability for the distance of transport of different elements and its dependence on particle size and meteorological factors and a determination of the extent of impact of pollution sources on air quality at distances remote from the sources. Moreover, the data obtained will aid in the setting of air quality standards by better evaluation of natural vs. pollution sources and by documenting the concentrations of trace metals as a function of particle size, information which may be related to aerosol respirability and impact on human health, and which may be linked to the types of processes occuring at pollution sources.

802 160

Objectives

The goal of this research is to develop experimental and theoretical methods for relating the properties of the pollution aerosol to the characteristics of emission sources.

Approach

This will be accomplished by starting from the observed chemical and physical characteristics of the pollution aerosol and testing certain hypotheses for the atmospheric changes which occur in the size distribution and chemical composition.

Progress and Plans

Chief among the atmospheric changes are the growth processes resulting from gas-to-particle conversion of organic vapors, SO_2 and NO_2 . By laboratory experiments with atmospheric air samples, data are being obtained on particle growth rates as a function of particle size. At the same time gas-to-particle conversion rates are being measured by chemical analysis. It is also proposed to initiate a separate set of studies on the deposition of aerosols in models of the human lung. The goal will be to estimate the rate of deposition of various chemical species present in the pollution aerosol at points of high deposition intensity.

802 207

It is the overall objective of this study to investigate the feasibility of using microbiological processes to mitigate the effects of hazardous materials spilled into water-courses. Several specific objectives have been established as follows: (1) investigate the response requirements for any hazardous material spill; (2) determine the minimum response requirements needed using microorganisms as a biological countermeasure for these materials; (3) conduct screening tests to determine candidate microorganisms for mitigating the effects of selected hazardous materials from the Environmental Protection Agency priority-ranked list of soluble hazardous polluting substances; (4) conduct model ecological system studies (simulating lotic and lentic environments) to assess total system response to hazardous materials and their decomposition products; (5) select microorganisms which mitigate the effects of the selected hazardous materials and conduct simulated spill experiments on the model ecosystems employing these organisms to assess their mitigation efficiency; (6) develop production, storage, reculture, and deployment methods for bacteria selected; and (7) evaluate the practical feasibility of using microorganism countermeasures for mitigating the effects of hazardous material spills.

The work includes literature surveys and experimental work in biological treatment units and in aquatic microcosms to determine the biodegradability and fate of hazardous materials and tests on simulated spills of these hazardous materials in contained aquatic ecological systems. The materials being tested include acetone cyanohydrin, acrylonitrile, aldrin, benzene, cyclic rodenticides and insecticides, DDT, isoprene, methyl alcohol, nitrophenol, nony phenol, phenol, styrene, xylene, and toxaphene.

802 235

Progress as of December 1973 on EPA research grant R-802 235 has consisted of purchase and calibration of ozone monitors and meteorological instruments; installation of mounting booms, supports and data cables on the Mt. Sutro TV tower, writing and testing basic data reduction programs; and the start of air pollution climatology studies using data. Problems have included delays in instrument delivery, delays in tower delivery and difficulties in tower installation. Data collection should start by February 1974. Basic data reduction programs are in progress. Results of preliminary statistical analysis on existing meteorological and air pollution data, while not statistically significant, seem to show an inverse correlation between afternoon inversion base height and high hour oxidant readings in San Jose.

802292

The primary objective of this project is to disinfect parallel streams of effluent from a secondary activated sludge wastewater treatment plant with chlorine and ozone. Part of the chlorinated effluent stream will be dechlorinated with sulfur dioxide. The chlorinated, dechlorinated, and ozonated streams, and a control stream of the same effluent, would be compared for their toxic effect on several species of fish and macroinvertebrates. Disinfectant dosage will be controlled at levels sufficient to yield effluents having a total coliform count not to exceed 1,000 per 100 ml, but use of gross excesses of disinfectant beyond the amount necessary to yield the desired reduction in coliform content will be avoided. Results obtained will provide a basis for determining which system of treatment will combine the desired level of disinfection with the lowest toxic effect on the biological forms used in the tests.

The same work will be carried out at a trickling filter plant that has industrial effluents equal to more than half its load.

The project will commence after both plants have begun removing phosphates in compliance with the Lake Michigan Enforcement Conference orders.

A fifth stream of final effluent disinfected with Bromine-chloride may be added at both plants.

802309 .

1. The primary objective of this project is to restore Shagawa Lake bordering the City of Ely, Minnesota from a highly eutrophic condition to a healthy state.

2. To accomplish the above objective, it was determined to be necessary to substantially upgrade the quality of and to remove essentially all phosphorus from the City of Ely's high-rate trickling filter plant effluent. This effluent constitutes virtually a point source of phosphorus discharge into the lake. A 1.5 mgd tertiary treatment plant has been constructed to further treat the trickling filter effluent. Tertiary facilities consist of flow equilization, two-stage lime clarification, dual-media filtration, and chlorination. Lime sludge is mixed with digested sludge from the trickling filter plant and disposed of via gravity thickening, vacuum filtration, and trucking to sanitary landfill. The concentration of phosphorus being sought in the tertiary effluent is 0.05 mg/l as P, or less.

3. In April 1973, three years of carefully-controlled operation (using EPA and City personnel) was started, during which time, it is hoped the restoration of Shagawa Lake can be demonstrated. After 18 months of operation, it has been shown that the residual phosphorus objective of 0.05 mg/l as P can be routinely achieved.

R802370

I. Objective: The primary objectives of this proposal are: 1) to determine whether the toxic effects of lead in animal brain is related to an interference with gamma-Amino Butyric Acid synthesis (GABA) and 2) whether there is a correlation between GABA synthesis and the ability of an animal to learn tasks. In its final year, the project will also examine any possible correlation between the elevation of delta-amino-levulenic acid excretion in urine and glutamic acid decarboxylase (GADC) activity in the brain as well as the kinetics of the GADC inhibition by lead.

II. Relationship of this project to the program's mission: The research is important to the program mission of the Environmental Toxicology Division, because it establishes the type of neurochemical effects that lead may have on the mammalian central nervous system.

III. Specific program identification: This project directly supports P.E. No. 1LA629, Milestones #2, Task #6, of the Health Effects Research Laboratory.

IV. Explanation of any apparent duplicative or excessive effort: This project is not duplicative nor is it excessive to any effort by HERL.

V. Reviews: This is a continuation application and does not require extramural reviews. The regional comment and the in-house technical review recommended that this project receive support for completion of the final year. Dr. Edward Faeder, in-house reviewer, suggested that the behavioral experiments to be conducted this year are an important addition to the biochemical measurements already completed. The study correlates lead intake, brain lead levels,

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R802388

This project is in the second year of a proposed three-year study. Its purpose is to learn effects of selected pesticides on fresh water algae. Effects upon growth, morphology, respiration, photosynthesis, chlorophyll content, chloroplast morphology, cellular organization, motility and recovery after exposure will be studied. Also, uptake of the pesticides will be determined.

Algae species are *Chlorella pyrenoidosa*, *Chlamydomonas eugametosa*, *Pandorina morum*, *Chlorococcus* sp., *Scenedesmus quadricaula* and *Euglena* sp. Pesticides are aldrin, dieldren, endrin, heptachlor, seven, malathion, baygon, atrazine and simizine.

R802596

(1) Objectives

1. Development of diesel exhaust particulate matter characterization data on a turbocharged diesel engine using: i) the Andersen Impactor in conjunction with the Scanning and Transmission Electron Microscopes, ii) the particle size distribution using the Thermo-Systems Model 3030 electric aerosol analyzer, and iii) the concentration of the sulfate fraction of the particulate matter.
2. Development of a total hydrocarbon balance using a Flame Ionization Detector (FID) to measure total hydrocarbons in the undiluted and diluted exhaust.

(2) Approach / (3) Plans

The above objectives will be carried out using a special test setup designed and developed under this grant during the first two years. The test setup has a undiluted exhaust test section, and a dilution tunnel that simulates the ambient dilution of diesel exhaust. A Cummins VT-903 turbocharged engine will be used for these studies. The engine will be operated on the EPA 13-mode cycle. These data will be used to analyze the effect of load and speed on the chemical and physical character of diesel exhaust particulate matter using the measurement methods outlined in the objectives.

S802681 02

This project will demonstrate the ability of a modified block cut method of surface mining to reduce the amount of sediment and water pollution resulting from strip mining of coal in a typical location in Eastern Kentucky. The quality of water runoff from a small, isolated, undisturbed watershed at the head of a small, seasonably flowing stream will be determined prior to the mining operation or other disturbances of the watershed surface or subsurface. The mining operation will then be conducted by a modified block cut method and the quality of water flowing from the mined area will be continuously monitored. Comparison of the water quality before mining operation will be made with the quality of water during and after mining to determine the water pollution effects of the block cut method. Cost of mining operation using the conventional method will be compared with the cost using the block cut method to determine the theoretical cost difference between the two methods and the cost effectiveness of reducing pollution by the block cut procedure.

802719

The objectives of this project are to design, fabricate and operate for a sufficient period a unique treatment system of a transportable nature to perform with high efficiency and flexibility for interim applications, such as a new housing development which will not receive adequate sewerage for a significant period of time. All aspects of the project will be documented in order to demonstrate the efficacy of the system for nationwide application.

Approach:

The system, consisting of screening, chemical clarification, nitrification tower, filtration and carbon adsorption, will be fabricated after pilot-study determination of optimum design parameters. The system will be mounted on skids for transportability and operated through startup and routine stages. Certain specific studies will also be made to test the capabilities of the design.

R802755

The use of ion-selective electrodes and molecular probes for analysis of natural and waste water is being investigated. Specifically, the use of the cyanide electrode and the ammonia probe are currently under study. While the use of the cyanide electrode for measuring cyanide ion concentration has been demonstrated, the relationship of these readings to the classical total cyanide determination is not known. This is being determined.

The ammonia probe is being used to measure the total Kjeldahl nitrogen by a procedure which does not require distillation and titration.

Work with the cyanide and ammonia electrodes on synthetic laboratory samples is now nearly complete. Application of these electrodes to natural and waste water samples is about to begin. Samples representing a variety of analysis conditions will be obtained from the Miami Conservancy District, Dayton, Ohio and the response of the probes checked with them to determine the application of the probes under a broad spectrum of realistic conditions.

Application of the newly available sulfate electrode to water quality analysis will be undertaken.

R802 759

The proposed research program is to apply mathematical methods to monoenergetic photon excitation, energy dispersive X-ray fluorescence analyzers in the elemental analyses of particulates on filter paper. The major objectives is to automate this method of analysis as much as possible. To accomplish this, five individual objectives can be identified. These are: (1) Obtain or develop if necessary the standard computer programs required to: (a) gain shift spectra to obtain a standard pulse-height calibration and (b) to identify characteristic X-ray energies; (2) Develop the least-squares matrix approach for determining X-ray intensities from pulse-height spectra; (3) Develop the mathematical models necessary to determine elemental compositions from X-ray intensities; (4) Develop the computer software and data handling techniques necessary to implement the methods described; (5) Demonstrate the computer automation on a prototype X-ray analyzer. Objectives 1, 2, and 3, have essentially been accomplished. The major portion of the work during the present period will be devoted to Objectives 4 and 5.

802 780

This project is part of a coordinated program designed to assess the effects of euthrophication on biological processes in Saginaw Bay and the impact of conditions and processes in the bay on water quality in Lake Huron.

Proposed work includes:

1. An initial assessment of euthorphication patterns as reflected in relatively conservative elements of the system such as the benthic invertebrate fauna.
2. Synoptic cruises to measure gross patterns of change in phytoplankton and zooplankton distribution and abundance in Saginaw Bay and adjacent waters of Lake Huron. Complimentary chemical measurements will be taken under another project.
3. These results will be used to plan an intensive field observation program. Measurements included in this program are: 1) Abundance and species composition of phytoplankton. 2) Estimates of standing crop of phytoplankton [Chlorophyll a, TOC, cell counts]. 3) Estimates of phytoplankton process rates [14C fixation, N fixation]. 4) Species composition and abundance of zooplankton standing stock. 6) Estimates of process rates of zooplankton. These measurements will be fully coordinated with chemical measurement program carried out under another project.

802 815

I. Objective: The objective of this grant is to quantitatively assess the transport/transformations and removal of urban aerosols and their precursor gases.

II. Relationship of this project to the program's mission:

This program is a part of the Regional Air Pollution Study. The grant has and will continue to contribute to the development of models for the transport/transformation and removal of aerosols.

III. Specific program identification:

This project will specifically support ROAP 26AAI, Task 230 of the FY 75 approved work plan.

IV. Explanation of any apparent duplicative or excessive effort:

This grant is part of the Atmospheric Aerosol Research Section's program of aerosol studies in St. Louis as part of the Regional Air Pollution Study. Since Washington University is located in St. Louis, this grant provides certain support to other grantees and contractors participating in the study. There is, therefore, an interrelationship between this grant and a number of other projects. However, there is no duplicative effort involved. Studies by Brookhaven of power plant plumes utilize a completely different measurement technique and analytical approach. Due to the importance of sulfate formation in plumes, it is not considered that two plume studies constitute excessive effort.

802 871

(1) Objectives - The primary objective of this proposal is the development of a flow-through rearing system suitable for chronic bioassay of larval anthropods, and to test the measures of variance and reliability for a representative species, Palaemonetes pugio. Cadmium has been selected as the toxicant.

(2) Approach - Using a flow-through system experiments utilizing sublethal levels of Cd will be conducted. The stages will include newly-hatched zoeae, post-larval stage, and adults.

(3) Current Plans-Three measure of response will be used to determine the physiological integrity of the test organism: survival, metabolism, and behavior. Since a number of factors are known to influence these responses, the affects of stage in the life cycle, sex, season of the year, thermal history, salinity, and geographic distribution will be assessed.

R-802874

The objective of this project is to provide a thorough evaluation of the problems involved in the treatment and disposal, i.e., management, of wastewaters from homes and other isolated facilities located in unsewered areas and to study solutions to those problems from an interdisciplinary prospective. Specifically, the areas to be studied include waste characterization; waste treatment systems; clogging phenomena and physical, chemical, microbiological and viral aspects of soil disposal systems; disinfection and the institutional alternatives for optimizing individual home systems. Both commonly used and innovative systems will be studied and characterized.

The approach being employed utilizes both laboratory and field studies in concert with each other. Emphasis is placed on the development and study of alternative solutions to existing technology and modification of existing technology to improve or widen its applicability. Each technology is being monitored to determine its institutional requirements for optimization on an area-wide basis.

Progress to date has included waste characterization of individual home wastewaters, performance data on several treatment sytems, improved soil system design methods, soil performance data on bacteriological and viral removal phenomena and innovative soil systems.

R802890

The proposed research program is a continuation of the project designed to determine lead concentrations in the teeth of young children as well as in contaminating dust samples from the homes of donors and air samples from the immediate area. In addition, automobile traffic rates in the immediate area will be studied and socio-economic data collected on the families of children under study. The samples are being collected in Birmingham, England, a city which offers a unique laboratory for such a study, i.e. a tremendously large cloverleaf, around which are constructed many high rise apartments and a state housing development.

Additional analysis will be run on lead levels in blood collected from the donors. Correlations between lead levels in teeth, dust and blood will be made with socio-economic data, children's cavity count and school achievement records.

It is expected that the correlation between automobile traffic, lead accumulation levels student school achievement and mobility patterns will be shown.

802905

A minieral addition project will be undertaken to evaluate phosphorus removal and overall upgrading potential for a 0.46MGD municipal wastewater treatment plant employing the Rotating Biological Contactor(RBC) process. Both aluminum sulfate and ferric chloride will be tried at two differant points, the influent channel to the RBC units(after primary clarification) and the effluent channel leaving the RBC units(before secondary Clarification). An extended 12 months testing program is planned eight months with aluminum sulfate and four months with ferric chloride. The objectives of the project are to consistently produce an effluent phosphorous concentration of 1.0 mg/l plus or minus 0.5 mg/l and decrease effleunt BOD and suspended solids residuals from conventional operation levels of 20-30 mg/l to 15 mg/l or less.

R802913

The nuclear technique of proton scattering will be developed into a broad range quantitative analysis method for air particulate matter for all elements up to potassium. Data acquisition and data evaluation times as short as 5 minutes are an objective. Proton scattering spectra and cross sections have been determined using 16 Mev protons from a Tandem Van de Graaff accelerator. A computer program is being developed to utilize it to quantitatively analyze the elemental content of air particulate samples.

R802914 03

Purpose of study is to determine basis for stream standards for cyanide relating to fishes and invertebrates. Further objectives are to determine effects of temperature, oxygen levels, and other pollutants on fish sensitivity. Proposed work for the final segment of the cyanide study will include: (a) completion of temperature bioassay series to determine effects on sensitivity of two fish species; (b) chronic tests on bluegills and brook trout to determine success of spawning and growth; (c) acute and chronic bioassay of cyanide combined with zinc, ammonia, and phenol; (d) determination of photodecomposition of ferro-cyanide; (e) chronic bioassays will be done on two invertebrates. All work is in flow-through type apparatus using laboratory water.

R802955

It is proposed to continue for one additional year the research on pollution from septic tank disposal fields.

The major objectives of this project are:

a. To evaluate the passage and accumulation of pollutants in domestic septic tank disposal fields by use of field and lysimeter studies. The major pollutants to be investigated are total and organic carbon, ammonia, nitrate, nitrate and organic nitrogen, phosphates, salts, fecal bacteria and bacterial virus.
b. To provide a series of test plots available to EPA's National Ground Water Research Program at Ada, Oklahoma, for the study of movement and degradation of organic compounds in subsurface water emanating from septic systems.

The lysimeters and field plots are established and have been operational for nearly one year. Three undisturbed soils are enclosed in lysimeters and two soils are being investigated in the field. Application rates are based on design specifications of the Public Health Service.

At these application rates, changes in the field moisture regime have been negligible. Two additional fields have been started to which the septic tank effluent will be added on demand to keep the fields wet at all times.

At the design application rate, breakthrough of soils has occurred in the sand lysimeters, and indications are that it is just beginning in the loam lysimeters. It is anticipated that breakthrough will not occur in the clay lysimeter for several more months. To date, only one collection point has indicated the presence of fecal bacteria at a depth of 120cm below the septic field.

R802974

The objectives of this project are: 1. To elucidate factors affecting movement of nitrogen and phosphorus in a watershed in the Great Lakes Basin; 2. To collect analytical data together with prior hydrologic and climatic data which will allow for evaluation by systems analysis of movement of nitrogen and phosphorus from soils; and 3. To cooperate with members of the Southeast Environmental Quality Laboratory to develop data for systems analysis of nitrogen and phosphorus loss from soils. Fertilizer applications of nitrogen, phosphorus and potassium (KCl) are applied to each of two watersheds and incorporated into the surface 7.5 cm of soil. Sampling of the different areas of the watershed and analysis of the samples establishes an initial mass balance for each element. During each rainfall event that produces runoff, both water and sediment loss are measured and the content of each assayed for nitrogen, phosphorus and chloride. Soil samples are again collected and analyzed to determine the new balance of nutrients within the watershed. This data is used to develop, calibrate and verify systems models of nutrient loss from watersheds.

S-802985

The primary objective of this demonstration project is to show the advantages of implementing a "package" of technological improvements within the lateral subsystems in reducing the salt load entering the Colorado River. Although major emphasis is upon on-farm improvements, considerable improvements in the water delivery conveyances are also required, as well as some improvements in lowering high water tables (drainage).

This project will utilize each of the salinity control measures developed in Grand Valley, as well as the addition of various irrigation methods, to demonstrate the complete package of salinity control measures for two laterals under each of five canals. No single measure will adequately alleviate the salt load from an irrigated area. Demonstrating the complete package of salinity control measures will not only be a "first," but additional salt load reductions can be expected beyond the sum of each individual measure because of improvements in the operation and management of each lateral. The lateral subsystem begins at the canal turnout and includes all of the water conveyance channels below the turnout and the farm lands served by the lateral water supply.

803 009

In recognition of the serious pollution hazard that certain industrial wastes especially heavy metal ions (e.g., mercury, nickel, chromium, lead, etc.) pesticides and other residues from domestic and agricultural activities pose to the environment protozoa will be used to identify and measure the amount and toxicity of these contaminants. Because of their widespread occurrence and high sensitivity to the presence of toxic substances in these systems. Bioassays will be conducted using the three most widely used protozoa in research (Amoeba proteus, Buglena gracilis and Paramecium caudatum) to determine at what concentrations these various pollutants inhibit growth, movement, and survival. The information generated from this study can be used to establish water quality criteria and discharge regulations to protect aquatic life.

803 030

Objectives

Structure, implement, verify and apply a eutrophication model of Lake Huron including Saginaw Bay and of Lake Erie including anoxic zones.

Approach and Progress

A five segment Lake Huron model has been constructed and brought to a final verification stage utilizing all available data. Phytoplankton and zooplankton reaction kinetics have been developed which simultaneously describe both Saginaw Bay and open lake waters of Lake Huron, areas which differ markedly in concentrations of both chemical and biological parameters. Preliminary nutrient reduction simulations have been performed.

A preliminary Lake Erie model has been developed and the transport regime of this model is being verified while simultaneously all available biological and chemical data are being reduced for a forthcoming eutrophication model.

803 072

The objective of the proposal work is to determine whether herbicides that affect transpiration affecting stomatal closure, alter the suceptibility of soybeans to acute or chronic ozone injury. Differences among cultivars will also be evaluated. The experiments will be done in Mississippi. Reduction in ozone injury may be achieved either chemically by the use of certain compounds or the abstainance of the use of certain compounds in areas affected by ozone pollution, or genetically by planting the more resistant varities.

803 078

The City of Denver experiences over 200 atmospheric inversions each year which produce haze and decreased visibility over significant portions of Denver. In 1973, the U. S. EPA began a research study to determine the cause and sources of this pollution problem. One important aspect of the study involves the identification of aerosols collected from the atmosphere. In a previous preliminary study (1972), polarized light microscopy was used successfully to identify many of the aerosol particles.

The goals of this current proposed study is to trace the sources of aerosol particles collected by the EPA and other agencies at a network of sampling stations, by identifying the types of particles and comparing them to reference samples. The particles will be characterized and identified by polarized light microscopy supplemented with scanning electron microscopy and mass spectrometry. The data from these analyses will be correlated with meteorological and aerosol data to discover the impact of individual sources in producing haze.

803095

The objective of this research is to study the nature and extent of chemical and physical interactions between environmental toxic substances (e.g., organic pesticide materials, and heavy metal atoms) and biological macromolecules.

Specific studies to be performed include evaluation of the mechanism and geometry of weak interactions between chlorinated hydrocarbon and phenol pesticide materials and various biosystems including phospholipid model cell membrane systems, enzymes and nucleic acids. Other studies will examine interactions between heavy metal ions such as Hg^{2+}, Cr^{3}, Fe^{3+} and Pb^{4+} with enzymes, enzyme substrates and enzyme inhibitor systems.

The approach used, Fourier transform ^{1}H and ^{13}C nmr, is particularly sensitive to these kinds of interactions. ^{13}C spin-lattice relaxation parameters probe the motions and interactions of the toxic materials in contact with relatively immobile biopolymers.

New experimental techniques currently under development will extend ^{13}C nmr spectrometer sensitivity to <1 millimolar solutions at natural ^{13}C isotopic abundance. These new techniques are being developed on a superconducting multi-nuclei FT nmr spectrometer.

803104

It is proposed to review all existing summarized air quality data to see how closely it agrees with the log-normal distribution which is widely used to represent such data. Then the results will be used to prepare a manual for air quality managers on the examination and analysis of air quality data.

R803141

Studies of the interaction of surface slick microorganisms and selected organochlorine pesticides are in progress. The effects of heptachlor and other chlorinated hydrocarbons on the fatty acid and hydrocarbon metabolism of surface slick microorganisms are being investigated. The activity of selected microorganisms is being evaluated in an hexadecane-heptachlor (^{14}C) model system. The accumulation and/or biodegradation of pesticides by bacteria, yeasts, and filamentous fungi is being considered in regard to their primary role in food webs.

R803154

The objective of the proposed research are to study the short and long term effects of cadmium on the ultrastructure of type A spermatogonia along the basement membrane of the mouse testis. For the short term study male CD-1 mice will be injected with a single sublethal dose (2mg/kg) of cadmium acetate and cadmium chloride. The mice will be sacrificed at designated time interval after injection and the tissues prepared for electron microscope analysis. For the long term study mice will be give protracted doses of cadmium acetate and cadmium chloride in water over an extended period. The short and long term effects of cadmium on the ultrastructure of type A spermatogonia will be determined.

R803201

Metallothionein appears to play a role in absorption, transport, excretion of cadmium and in the protection against the toxicity of this metal. At present, there exists no sensitive method for assaying the amount of this protein present in blood or tissues. After extensive exposure of rats to cadmium, metallothionein is isolated from the liver and kidney in sufficient quantities to develop in rabbits antibodies against this protein. It is proposed to develop a radioimmunoassay procedure for metallothionein.

R-803212-01

The objectives of the project are 1) to ascertain the extent of adoption of granular media filters for tertiary treatment of municipal wastewaters in the continental U.S., 2) to collect and evaluate the operating data which are available for the tertiary filters in the State of Illinois, and 3) to carry out a detailed evaluation of the performance of fifteen tertiary filters in the Chicago area. Tertiary filters are intended to achieve higher levels of removal of BOD and suspended solids from municipal wastewaters than can be achieved by secondary treatment alone. The performance of the filter may vary depending upon whether an activated sludge process or a trickling filter is used for secondary treatment. The apporach for this project will be to obtain operating data from tertiary filter installations in Illinois and to select 15 plants in the Chicago Area for intensive sampling. The plants selected for sampling will include one trickling filter palnt and two activated sludge plants each of which will be sampled for one month of each season for a year. Twelve other plants will be selected for sampling for a one-month period during the year. Samples will be obtained of the secondary effluents and tertiary effluents. These samples will be analyzed for BOD, suspended solids (and their character), and several other water quality parameters. The quality of the tertiary effluent will be compared with that of the secondary effluent to determine the effectivness of the filter.

803215

I. Objectives: The objectives of this grant are as follows:

1. Continuation of a survey study of the insect and fungal populations, infestation, and damage to species of indigenous plants at the seven NERL sites and the 15 ponderosa pine supplementary sites.

2. Continuation of the analysis and selection of indigenous plant species which have a diversified but understandable interrelationship with selected insect and fungal species collected from the study sites.

3. Continuation of selecting and testing of destructive and beneficial fungal and insect species used for determining bio-environmental impacts of the emissions of fossil fuel power plants on these fungal and insect species and their relationship to plant species.

4. Continuation of chemical analysis of these indigenous plants and insects which are being utilized for intensive investigation of the potential impact of the emissions of fossil fuel fired power plants.

5. Continuation of studies on the growth of ponderosa pine trees at sites with high probability of being impacted by the emissions of the Colstrip Units 1 and 2 coal-fired power plants.

R 803254

The principal objective during the first year was to test the significance of differences in reported symptoms classified by type associated with swimming at a beach which is "barely acceptable" in respect to local criteria for recreational waters, compared to a "relatively unpolluted" beach. The principal objective during the second year is to place four beaches on a water pollution gradient to establish a mathematical relationship between symptoms classified by type and water quality indicators. This work is an integral part of Recreational Water Criteria Program efforts to develop health effects criteria for marine recreational waters.

Trials consist of initial beach interviews on both the Saturday and Sunday of the same weekend and telephone or mail follow-ups 8 - 10 days later. Pretests in 1972 - 73 indicated that beach interviews and follow-up questionnaires yield accurate data on demographic characteristics, bathing activities and subsequent symptoms of the population at beaches on weekends. In the first year, four weekend trials were conducted on two New York City Beaches. In the second year, four sites on a pollution level gradient at a New York City beach will be selected; four weekend trials will be conducted at each.

R 803291

This project aims to study the effect of the Aswan Dam and water impoudment in Lake Nasser on River Nile water quality and use in Egypt. More specifically, the project aims to

(1) define current patterns of ecological transformations in Lake Nasser,

(2) correlate water quality characteristics in the River Nile above and below Lake Nasser, and compare this with data obtained before the construction of the Aswan Dam,

(3) develop comprehensive water resources models relating water quality and needs for municipal, industrial and agricultural purposes, etc.,

(4) predict future trends in water quality transformations and their impact on the social and economic aspects of water use, and

(5) propose water resources management plans.

R803299 01

In recognition of the fact that an increased use of platinum compounds is being considered in a wide variety of industries including, petroleum (platinum based catalytic enzymes to raise the octane content in gasoline), automobile (in exhaust system) and well established autimitotic activities of certain platinum compounds on biological system, it is very pertinent that its potential as an environmental health hazard to man be carefully evaluated.

Because of the sensitivity of the system, cost, time, case of experimentation, and most of all, its relevancy to man, mammalian cell culture system (TK locus of mouse-lyphoma cell line, L 51784) will be employed to estimate the mutagenic potential of platinum compunds. Arachis test system has been includediin the study to further test these compounds under in vivo system to supplement results. The information obtained from this study may be used to establish the criteria for regulating the permissible level (if any) of platinum in the environment.

803315

A model will be developed to simulate the input to stream channels from non-point source pollutants. The water quality indices to be considered include sediment, BOD, DO, TDS, and conservative constituents. Submodels, which describe the interactions with surface runoff and sediment loss, will be developed and coordinated with existing hydrologic and sediment production models. The result will be a general non-point source model, with wide-spread applicability, which will provide estimates of expected loadings to stream channels from non-point source pollutants. The research effort will investigate problems associated with various land use activities, such as urbanization, agriculture, silviculture, and construction and development.

Upon completion of the model, an attempt will be made to evaluate critical model parameters, on a regional basis for the entire U.S. This effort will provide parameter maps of the U.S. from which planning officials can obtain preliminary estimates of the non-point source pollutant input to stream channels.

Keywords: *simulation, *non-point source pollution, *land surface washoff, planning, hydrology, sediment loss, water quality

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803370

Overall Objectives

A four-year study of New York Harbor and adjacent waters is proposed by the Louis Calder Conservation and Ecology Center of Fordham University in conjunction with the New York Ocean Science Laboratory. From an overall point of view the main objectives of this research will be:

1. to provide information relevant to the kinds of treatment necessary for municipal waste discharge into coastal waters and
2. to provide information relevant to how the results of various treatments might influence water quality;
3. to determine how changes in water quality may lead to massive algal blooms (noxious and/or toxic) in these waters;
4. to determine whether the quality of the waters in New York Harbor is being affected by materials flowing into the area from the old offshore sludge dumping sites or from newly established ones;
5. to determine the toxigenicity of these materials to the primary producers is reflective of changing water quality;
6. to construct through cooperative and integrative efforts a dynamic and predictive model system for this area to be used in the economic, sociological and scientific planning for the future development of water resources in this area.

R803389

Will explore the chemistry of ion selective electrodes (ISE's) as well as the applicability to solution of environmental analytical problems. In particular, the analysis of atmospheric particulate nitrate by ISE as well as commonly used methods will be rigorously and thoroughly evaluated. A critical comparison of the methods with regard to precision, accuracy, and interferences will be undertaken. An important part of the evaluation will be the analysis by the various methods of approximately 100 atmospheric particulate samples which are to be obtained as part of an EPA survey. A prototype quasi-real time atmospheric particulate nitrate monitor is to be carefully tested and, if possible, improved.

R803395

The study involves the characterization of a recently discovered virus of the pink shrimp, Penaeus duorarum. The relevance of this study resides in the fact that the shrimp virus is remarkable similar to insect viruses of the Baculovirus group which are being applied as biologial pesticides for the control of certain agricultural insect pests. This is the first report of a virus structurally similar to the occluded insect viruses as infecting invertebrates other than insects. The research will direct activities toward investigating the biochemical, structural and biological properties of the shrimp virus as compared to known similar properties of the insect granulosis and nuclear polyhedrosis viruses. Characterization of the shrimp virus will aid in developing specific monitoring systems for the detection and survey of the disease as it exists in nature and thereby evaluate the extent of seriousness. Also, such studies will begin to increase our understanding of the capability, or potential capability, of certain viruses being utilized as biological pesticides in non-target invertebrate systems, and conversely.

R803399

The objective of the study is to evaluate long path laser monitoring of ambient level air pollution. The lasers that have been considered are semi-conductor diode tuned lasers and sequentially step tuned carbon dioxide lasers. Systems employing both techniques were tested during the summer of 1974 in St. Louis in connection with the Regional Air Pollution Study (R.A.P.S.). However, only the diode tuned laser system will continue to be tested during the summer of 1975.

The present plan is to use the laser system to make pollution variability measurements around two one kilometer square areas in the St. Louis area as a part of RAPS. One site will be urban and the other rural. A concurrent study will be made of the same area using portable monitors and bag samples. The results of the two methods will be compared.

Assuming favorable results from the comparison, it is planned to use the system during the summer of 1976 to make several pollutant variability studies for carbon monoxide, nitric oxide and ozone.

803401

The objectives of the proposed work are as follows: a) critical evaluation of past and current studies and their relevance to expected engine configuration at the time when methanol blends might be used as a vehicle fuel; b) definition of a research program which will address those performance, emission and practical use characteristics of methanol blends as identified as being lacking in objectivesa; c) evaluation of emission measuring techniques, selection of instrumentation for aldehyde and methanol measurements.

The approach used is as follows: a) determination of baseline performance and emission characteristics of a gasoline fueled multi-cylinder engine; b) determination of performance and emission characteristics of a methanol/gasoline blend fueled multi-cylinder engine; c) experimental evaluation of material compatibility problems identified in objective b; d) development of emission measuring techniques identified in objective c.

The current plans are to address the objectives during the first portion of the program with a conventional internal combustion engine. During the latter portions of the program, futuristic power plants identified in objectives a) and b) will be used.

R-803403

The proposed research addresses several important analytical problems in the chemistry of the iodimetric reference method for ozone measurement. The objectives include: (1) an accurate characterization of the chemistry of the iodide reference method for low concentration (.01 - 100 ppm) ozone; (2) the development of an iodometric ozone analysis which is insensitive to the absorption apparatus used or to ozone concentration level; (3) the determination of heterogeneous ozone decomposition rates on the surface of common air sampling materials under laboratory and field conditions; and finally,,(4) a study of whether prior conditioning of materials with ozone will improve their characteristics in sampling service.

In order to accomplish these objectives, ozone mixtures in oxygen were calibrated against ultraviolet and chemiluminescent standards. These analyses are being examined as a function of absorbent pH, the type of absorber of bubbler used, the degree of acidification during analysis and other factors such as temperature and the concentrations of iodide and ozone. Heterogeneous ozone decomposition rates will be computed by subtracting the homogeneous decomposition, based on literature data, from the total loss measured in an isothermal, controlled humidity flow system.

R803415

(1) Objectives: (a) To measure the qualitative and quantitative distribution of hydrocarbons in Providence River dredge spoil deposited in Rhode Island Sound. (b) To investigate the release of petroleum hydrocarbons from the deposited dredge spoil into the surrounding water. (c) To determine the distribution of petroleum hydrocarbons in benthic animals from the dredge spoil disposal site.

(2) Approach: Samples of dredge spoil (surface and core), sea water, and benthic animals will be collected from the disposal site and extracted with organic solvents. The hydrocarbon fraction of the extracts will be isolated by column and/or thin-layer chromatography. Analyses of the hydrocarbons will include gas-liquid chromatography, infrared spectrometry, and combined gas chromatography-mass spectrometry.

(3) Progress: All procedural details of the analysis for hydrocarbons in *Arctica islandica* have been worked out. Samples have been obtained from all relevant stations and analysis for total hydrocarbons is complete on 75% of the samples. Further qualitative and quantitative analysis of the clams' hydrocarbon assemblage is proceeding.

R803423

We will measure the absorption and tissue distribution of cadmium in rats receiving low concentrations of $^{109}CdCl_2$ in drinking water, in a diet containing flour from wheat grown on $^{109}CdCl_2$ and in a diet containing added $^{109}CdCl_2$. The influence of various factors, such as calcium, magnesium and iron in the water, and of protein quality and concentration in the diet on the absorption of $^{109}CdCl_2$ from drinking water also will be assessed. We will also determine the amount of ^{109}Cd present in the low molecular weight cadmium binding protein from kidneys of rats receiving various concentrations of cadmium.

R803458

Objectives: Our objective is to develop antibodies to an "active" derivative of Mirex which inhibits the ATPase system from fire ants. These antibodies will be used to determine if the inhibited enzyme system can be reactivated *in vitro* by the removal of the "active" derivative of Mirex through competitive binding of the highly specific antibodies.

Approach and Current Plans: Produce sufficient quantities of Kelevan-BSA to maintain antibody production in rabbits. Produce Kelevan-BF (bovine fibrinogen) for the immunodiffusion test to determine the presence of antibodies. Produce sufficient quantity of antibodies to Kel-BSA for isolation and purification studies. Determine the effect of the antibody to the hapten, Kelevan, on ATPase activity in the presence and absence of Kelevan in the reaction mixture. The antibody will be tested under conditions which will permit evaluation of its relative affinity for Kelevan compared to that of the ATPase system. Tests will be conducted *in vitro* to determine the protection of ATPase activity by the antibody against inhibition by Kelevan and to determine if the Kelevan inhibited ATPase can be reactivated by the antibody.

803505

The primary objective of this project is to evaluate the microbial kinetics and to assess the process feasibility of autotropic microbial mediated denitrification using sulfur as an energy source. The metabolic and environmental requirements of sulfur oxidizing denitrifying bacteria will be investigated using batch culturing and continuous culturing experiments. Several forms and sources of sulfur will be used with emphasis on those obtained from stack gas desulfurization and fossil fuel combustion. Various process configurations, e.g., plug flow and completely mixed slurry reactors and film reactors will be studied. A desk top engineering and economic feasibility assessment will be completed.

R803510

The overall objectives of this project are a. to further develop and refine efficient rapid and inexpensive monitoring methods for the detection and quantitative assay of low levels of viruses in large volumes of water and wastewater, and to evaluate various promising virus monitoring and detection methods by standardized and controlled procedures. b. to develop effective and economical procedures for the inactivation of enteric viruses in wastewater, renovated water and other forms of polluted water by ozone and to establish reliable methods for the control and evaluation of the process.

R803514 02

The primary objective of the research program is to gain understanding of the effects of air pollution on the transport processes in an urban atmosphere. The short-term effect of urbanization on the thermal structure and dispersion will be studied using an unsteady two-dimensional transport model which has been developed under the current EPA Grant No. R-8053514-01.

The major emphasis in the research program will be on numerical simulation of the effects of urbanization and human activity on the transport processes in the atmosphere under different meteorological conditions. Sensitivity studies will focus attention on the effects of air pollution and urban parameters on the thermal structure and dispersion in the planetary boundary layer. Special consideration in the numerical experiments will be given to simulating the radiative effects of pollutant layers aloft the city.

R803516

It is proposed to study the oxidation of sulfur dioxide in the atmosphere using the techniques of matrix-isolation and molecular fragmentation. Reactions of olefins and ozone and the subsequent oxidation of SO_2 will be monitored with a Model 12-A Fourier Transform Interferometer. Spectra of mixture of ethylene and ozone suggest the formation of at least two reaction intermediates. Argon diluted samples of sulfur dioxide and isotopic ozone revealed appreciable ^{18}oxygen exchange only after the sample was allowed to stand for two days. Detection of the reactive species provides the kinetic and structural data necessary to elucidate the oxidative mechanism of SO_2 and other pollutants such as the nitrogen oxides and vinyl chlorides.

R803520

The objective of this study is to collect comprehensive emissions data, especially sulfuric acid aerosol, from a fleet of in-use production catalyst vehicles. Each vehicle from a sample population of 80 to 100 vehicles will be repetitively tested at 5,000 mile intervals. Every vehicle in the study will be initially equipped with an engine hour-meter and fuel totalizer to be left on the vehicle throughout the duration of the study. At each test point the vehicle will be checked for tune-up parameters and obvious mechanical defects, but will be tested in an "as is" condition. A sample of tank fuel will be collected at each test for analysis.

A dilution tunnel has been connected to a constant volume sampler so that simultaneous mass emissions data can be collected for sulfate, SO_2, total particulates, hydrocarbons, carbon monoxide, oxides of nitrogen, and fuel economy by carbon balance. Each test will consist of several segments as follows: 1) one 1975 FTP test, 2) a one hour 50 mph steady cruise, 3) a series of up to five tests based on an EPA "sulfate driving cycle".

Analysis of sulfate collected on fluoropore filters will be by an automated barium chloranilate procedure. One filter collected during the cruise portion of the test will be analyzed by X-ray fluorescence for mass emission rates of the following: lead, sulfur, phosphorous, platinum, calcium, silicone, copper, aluminum, zinc, and iron.

R803524

The primary objective of this project is to evaluate the effectiveness and economic impacts of alternatives for controlling the loss of sediment, nutrients, and other pollutants from irrigated areas. Field work will be conducted in two irrigated areas in southern Idaho to (1) quantify the effect of tillage, irrigation and management practices on the quantity and quality of return flow from irrigated areas and (2) evaluate the effectiveness of settling ponds, vegetated strips, and other devices in removing sediment and other materials from the surface runoff from irrigated fields. Selected fields and pollutant removal systems will be instrumented so that all inflows and outflows can be continuously monitored. Flow samples will be collected at regular intervals and analyzed for sediment, nitrogen, phosphorous, and other constituents. Water, sediment, and nutrient balances will be established for each field site.

Enterprise and farm budgets will be developed to determine the costs and returns for the alternatives considered relative to their effectiveness in controlling surface runoff and pollutant losses. The aggregate effects of reducing the loss of sediment and other pollutants from irrigated areas will also be determined.

803525

"COMBINED MEMBRANE AND FREEZING CONCENTRATION OF BLEACHING RECYCLE WATERS"

The bleach plant is a major source of colored effluent in an integrated pulp and paper mill. The objective of this project concerns the on-site evaluation of reverse osmosis and freeze concentration as a practical combined system for treating or eliminating this effluent.

803592

Design and Performance of an Aerosol Mass Distribution Monitor

The applicant proposes to design, build, test, and deliver to EPA an instrument capable of detailed and rapid measurement of mass vs. size distributions of airborne particles and the collection of size fractions for chemical and physical analysis.

803596

The objectives of this research are two: (1) to undertake an analysis of the feasibility, benefits and costs of using building permit data to estimate and project the future demand by user class for water and subsequent investment in supply and distribution networks, and (2) to develop estimates of operating and capital costs, and cost and supply relationships as a function of space and topography, as related to cost/rate differentials among users of the same class and different classes (residential commercial, industrial). This aspect of the research is concerned with estimating the degree of internal cross-subsidies in the system.

The approach utilizes data from building permit applications and water supply records for the Cincinnati Water Work supply area. The analysis will utilize statistical analysis to estimate the relationships and test the appropriate hypotheses.

R803652

The proposed research involves the measurement of gas production rates and leachate composition to measure refuse stabilization under anaerobic conditions. The refuse has different steady state and transient moisture conditions to simulate actual landfill conditions. Optimum moisture conditions will be determined for the acid and methane fermentation phase during the refuse stabilization. These conditions can then be selected by enforcement agencies to create the most desirable environmental impact of the solid waste on the environment.

R803704

The present project is directed towards the problem of the dispersion and fate of hazardous materials in large lakes and emphasizes the dispersion and fate of hazardous materials in the near-shore and near-bottom aquatic and sedimentary environments. Three subprojects on numerical modeling have been initiated. These are concerned with the Cleveland Harbor, the Western Basin of Lake Erie, and a simplified two-dimensional model of stratified flow. Field observations have been made in Cleveland Harbor and the Western Basin. Laboratory and field studies have also been initiated to study sediment-water exchange processes. The emphasis is on understanding qualitatively and quantitatively the relative contributions to transfer from the sediments of resuspension and deposition, molecular diffusion, biological reworking of sediments and possible combined effects.

803710

I. Objectives:

The objectives of this Grant work are to obtain mass, size distribution, and chemical composition data from a Mercedes light duty diesel engine. Also, smoke intensity readings will be taken. The effect of operating parameters such as fuel composition, fuel additives, air-fuel ratio, injection timing, and rate of injection on particulate emissions will be determined. This project will be done over a three year period.

R-803754

The overall purpose of the proposed study is to examine the suitability of available quantitative methodology in designing optimal water quality sampling strategies, and to apply these techniques to a large lakes problem. The sampling program which is being sought will define an economically optimal strategy which satisfies given requirements of temporal and spatial detail. Furthermore, this optimal sampling program will meet confidence levels necessary for adequate model calibration.

S-803757

To demonstrate dry cooling technology as applied to a relatively small combined-cycle power plant. Performance of the system will be evaluated; design parameters leading to operating economy will be described; effects of plant operation on the environment will be measured, as will the environmental effects on the plant itself.

S 803758

Description of the Program - The program involves establishing a multi-material source separation system in Marblehead, Massachusetts:

- Weekly curbside collection of flat paper and mixed cans and glass; and
- Use of a compartmentalized collection vehicle

Program elements include: 1) Feasibility analysis (already completed); 2) Program design; 3) Implementation; and 4) Evaluation and documetation.

Objectives - The objectives of this program are as follows:

- To demonstrate and evaluate a multi-materials source separation program
- To document the demonstration and facilitate information transfer to other communities across the country.

In accomplishing the objectives outlined above, the program will demonstrate alternative source separation techniques, collection methods using a compartmentalized vehicle, and innovative methods of developing public participation in the program. It is anticipated that the results of this demonstration program will be of considerable benefit to other municipalities across the country, and that the techniques developed can be directly transferred to other source separation programs.

R803782

The objective of the proposed project is to develop a U. S. Truck and Bus Air Pollution-Fuel Usage Model. Fuel consumption and HC, CO, NO_2, and particulate matter emissions for gasoline and diesel engines are of primary interest. Also, the impact of control strategies such as diesel substitution and engine retrofit for emission and fuel economy will be analyzed. Furthermore, a systematic procedure for calculating and predicting the truck population for an Urban Air Quality Region will be developed. In order to reach the desired goals, the available information will be carefully analyzed and a computer model will be developed to produce best possible projections. Various factors describing the region will be identified for development of a truck population model at a regional level. The time span needed to complete the project is one year.

R803827

Objectives

(1) Modify and test a simulation technique for predicting the movement, in saturated earth materials, of contaminants generated through operation of land disposal sites.

(2) Evaluate the ability of the simulation to predict the effectiveness of remedial measures taken at a specific disposal site to limit the spread of contaminants.

(3) Demonstrate how the simulation approach can be used at disposal sites to:
- **a. Predict the impact of proposed or existing disposal sites on ground water quality adjacent to the site.**
- **b. Identify the most effective methods for preventing groundwater contamination.**
- **c. Optimize the design of sampling plans for monitoring contaminant movement and characterizing contaminant transport properties of field soils.**

Approach

An existing digital computer, Galerkin-finite element, transient, density dependent two-dimensional cross-sectional model will be extended to handle large, three-dimensional systems and will be field tested using data from a site which has already been instrumented and is being monitored because of groundwater contamination.

Progress

Just starting.

803834

Examine the use of potassium ferrate as an oxidant for the measurement of total oxygen demand (TOD). Compare effectiveness of potassium ferrate to presently used potassium dichromate. Investigate the effectiveness of potassium ferrate as an oxidant for ammonia and organic compounds. The study should result in a determination of the feasibility of a new method for TOD.

R-803839

Amounts of chlorine presently used in the drainage basin of Chesapeake Bay, and probably also some other large estuaries, could be large enough to sterilize the Bay if this chlorine were not degraded. A review of degradation processes reveals that perhaps 1% of the total chlorine may be converted to halogenated organic compounds, and it is suggested that some of these may be long-lived and susceptible to biomagnification. Arguments are given to indicate that organic compounds produced by chlorination of estuarine and marine waters may differ fundamentally from those produced by chlorination of river water and sewage in that bromine derivatives may predominate over chlorine derivatives in the marine waters.

A research project is proposed to test these ideas in the field near a power plant which employs 4-15‰ estuarine water for cooling, and chlorinates this to control fouling. The site is free of other nearby anthropogenic sources. The objectives of the project will be to: (1) identify and quantify the halogenated organic compounds produced by the plant, and (2) determine chemical factors controlling yields of the various compounds by studying the cooling waters under a variety of conditions.

R803851

Aerosol size distributions are being measured in St. Louis as part of the RAP's program from both ground based and aircraft mobile laboratories. These measurements are being made in conjunction with a complete array of chemical, physical and meteorological measurements. In conjunction with other collaborators of the team, new models for the conversion and transport of sulfate aerosols are being developed.

Also, experiments on the generation of sulfate aerosols, SO_2, NO_x, HC, and hetrogeneous aerosols are being conducted in a laboratory smog chamber.

In addition to providing a new data base for sulfur conversion, these experiments have already provided a new understanding of the fate of sulfur in urban and power plant plumes. Also, a new trimodal model for atmospheric aerosol size distributions has been developed.

Improvements in the already developed automatic aerosols size distribution measuring system will be made. A new automatic aircraft aerosol sampler for microscopy is being developed.

Extensive efforts are also being made to develop procedures for handling large quantities of miltivariable air pollution data using a special laboratory computer system.

R803 856

Funds are requested for the construction of a laboratory system which will provide running seawater at ambient temperature and at 2°C, 4°C, and 8°C above ambient. Fouling development and changes in fouling community structure will be followed at each temperature for several years on clay tile plates (232 cm) submerged in October 1975 and April 1976. Larval recruitment at each temperature will also be monitored. Parallel experiments will be conducted simultaneously on plates submerged under the Duke Marine Lab dock. Data will be used to determine the effect of heated effluents on community structure and function.

803 858

"EMISSION FORMATION IN HETEROGENEOUS COMBUSTION"

To provide trained manpower, fundamental information about pollutant formation in engines and ways of reducing these pollutants.

S803 863

Whey Wine Project:

The overall objective of the whey wine project is to demonstrate the commercial feasibility of making wine from whey. To achieve this objective, Foremost will utilize a multi-functional approach to determine the economic feasibility, production feasibility and consumer acceptance of whey wine. The output of this project should be a comprehensive analysis which can be presented to both large and small companies to encourage greater commercial utilization of whey.

Subsequent projects have indicated the feasibility of producing acceptable alcoholic beverages from cheese whey.

R803872

The objective of the proposed study is to determine sublethal effects of chlorine on growth, and survival of marine vascular plants and growth, survival, reproductive biology and behavior of selected decapod crustaceans. Effects and blood chemistry of the blue crab will also be investigated.

A laboratory approach will be used. Test organisms will be exposed to sublethal doses of chlorine in continuous flow systems. Pertinent biological parameters will be assayed periodically for periods of up to 6 mo. exposure. An attempt will be made to verify effects on blood chemistry of blue crabs with animals collected adjacent to sewage discharges.

R803881

The objective of this proposed investigation is to collect accurate data on particulate and gaseous pollutant concentrations and detailed micrometeorological data in the vicinity of a major highway in a non-urban setting. It is also proposed to conduct tracer gas experiments for the purpose of evaluating vehicle emission factors and dispersion coefficients. A site on a relatively undeveloped section of the heavily travelled Long Island Expressway will be used for the collection of data over a period of one year for the purpose of: (1) documentation of the distribution of carbon monoxide, lead, sulfate, and total particulates at an array of sampling points adjacent to a highway; (2) studying in detail the micrometeorology of highways, with special attention to those parameters important in the determination of sigma and stability values and highway generated turbulence; (3) reevaluating highway air pollutant emission factors from data gathered in tracer gas experiments; and (4) validating the applicability of existing highway air pollutant dispersion models.

R803883

The proposed research involves the monitoring of runoff from manure storage facilities. The total amount of nutrients lost through runoff will be determined (N, P, K, Ca, Mg and COD).

Two methods of dealing with potential runoff from manure storage sites will be evaluated. During the first year runoff and seepage will be collected and irrigated on cropland during the growing season. Druing the second year the manure will be covered to minimize precipitation from falling directly on the manure. Improvements in runoff quality will be determined.

Evaluation will continue of a questionnaire regarding dairy farmer attitudes to possible regulations on manure handling. Nutrient losses by alternate methods of manure handling will be compared.

803887

A comprehensive study is proposed of the occurrence of sulfur in particulate and gaseous form in continental and marine areas of the eastern U.S.A. Emphasis will be placed on the concentrations of sulfur in relation to other elements involved in its atmospheric transformation and transport and on the isotopic composition of sulfur and oxygen in relation to isotopic characteristics of natural and pollution sources. Sampling will be carried out as a function of particle size and time, so that the elemental and isotopic character of up to six size fractions may be determined separately, and these relations may be determined sequentially over time intervals as short as several hours. Sampling locations will consist of eight permanent stations from east of the Continental Divide to the Eastern Seaboard and of four temporary stations, including ships in the Atlantic Ocean, Gulf of Mexico, and Great Lakes downwind of major sulfur emission sources. Elemental analysis is performed using proton induced x-ray emission with nanogram sensitivity for sulfur, permitting resolution of particles < 0.25 µm diameter and time resolution over two hour sampling intervals. Isotopic analysis is performed using the new Micromass mass spectrometer with very small sample handling attachment, permitting precise analysis on 100 µg samples collected over 24 hour sampling periods with suitable cascade impactors. By means of the combination of techniques, the impact of fossil fuel combustion and other anthropogenic sources of sulfur on the natural characteristics of the atmosphere may be precisely determined.

803 889

An Engineering Guide is proposed to assist in standardizing construction, operation, maintenance and monitoring features of waste injection systems. The proposed Guide will encompass the entire spectrum of waste injection beginning with site evaluation through system design, operation and maintenance, monitoring, abandonment, and regulation. The Guide is to provide recommended standards for "in the field" use as well as a basis for state and federal regulations, if necessary.

The Guide and accompanying report on abandoned wells will be designed to meet the following major needs:

(1) to serve as a field applications and design manual for waste injection systems, emphasizing all design and construction features relating to the potential pollution of the ground-water resource.
(2) to serve as a comprehensive source of technical information on all aspects of waste injection systems.
(3) to serve as the first comprehensive report on current practices of well abandonment, their impact on water supplies, and the methodology necessary to correct the situation in the future.

R-803 896

"SULFUR BUDGET IN LARGE PLUMES"

The objective of this program is the determination of the fate of anthropogenic SO_2, i.e., the rate of sulfate formation and the rate of removal of SO_2 to the ground. During this budget year, individual power plant plumes, urban plumes, and plumes from power plant complexes will be studied.

R 803 900

The principal objective of this project is to generate reliable year-round performance data for a typical aerated lagoon system, operating on domestic wastewater, in the north Midwest. A second objective is to evaluate the effectiveness of this system in relation to its design criteria and to the secondary treatment standards of PL92-500. The study may be compared with recent studies on facultative lagoons. Work will be conduted at the existing 3-cell "Air-Aqua" lagoon system at Pawnee, Illinois.

R803901

Objectives: In the area of municipal solid waste preprocessing to recover both fuel and material resources of value, this research will attempt to evaluate various hardware and equipment items in terms of their individual and process schematic performance. The main object is a better understanding of the efficiency and combined operating economics and suitability of function.

Approach: NCRR's own facility in Washington, D.C. known as the Equipment Test and Evaluation Facility (ETEF) includes the necessary grinders, air classifiers, blowers, screens, trommels and aluminum and glass recovery units to conduct real-life operational tests. Comparative tests under varied conditions can be made easily, including changing the equipment if needed.

Progress: Currently the facility is essentially ready for operation, and research tests can begin almost immediately.

803902

(1) Objectives:

a) to develop a facility and methodology for the experimental analysis of coastal marine ecosystems and their response to energy-related environmental stresses

b) to relate the experimental results to ecosystem theory and its implications for the management of coastal marine environments

(2) Approach:

Replicate meso scale experimental ecosystems simulating a variety of common coastal marine environments will be developed and maintained at a special shore-based laboratory. A number of stresses or environmental perturbations associated with energy development will then be applied over a range of intensities to these systems before, during, and after the application of stress. Similar field experiments may also be carried out on a small scale in some environments.

(3) Current Plans:

The first project will involve 9 shore-based experimental water columns (5 m deep x 2 m dia.) with associated bottom sediments and benthos. The microcosms will first be studied for replicability and for differences between tanks that are run as open or closed systems with respect to sea-water flow. After this preliminary work is completed, a series of experiments involving the addition of water soluble petroleum hydrocarbons at concentrations of 100 and 1000 ug/l will begin.

R-803903

The study will assess the effects of using municipal solid waste as a supplementary fuel. Co-firing of MSW with coal in stoker and tangentially-fired boilers will be conducted and since one boiler is the same as at St. Louis, studies will permit confirmation, and comparison of selected St. Louis results. Assessments will be made of the technical and environmental aspects of these co-firing techniques. In addition, technical and economic tests and evaluations will be conducted on the second generation MSW processing facility associated with supplying the refuse derived fuel.

S803929

A site in upland South Carolina will be selected for construction of an overland flow sewage treatment system which can be operated in conjunction with a facultative lagoon so that both raw sewage and lagoon effluent can be applied to the land. A system for about 1,000 persons or about 100,000 gallons of wastewater per day is planned.

The construction will be completed during the first year. Operation of the system will be carried out during years two and three along with sampling and analyses required to evaluate the feasibility, reliability and efficiency of overland flow in treating both types of wastewaters.

R-803953

The objectives of the proposed work are to confirm laboratory studies of the leachate recycle concept with larger, prototype test cells and to elucidate information on mass flux of gas and leachate components, with particular attention to the effect of evapotranspiration on the rates and quantities of leachate. Two doubly-lined test cells, 12 x 12 x 10 feet high, one completely closed for quantitative gas measurement and the other covered with soil as is the usual practice at landfills, will receive identical volumes of water and weight of shredded solid waste. The moisture content will be brought to 60 percent (wet weight) by adding digested sewage sludge during construction. Gas will be monitored for CO_2, CH_4, and other constituents and total volume; leachate will be monitored for BOD, COD, TOC, total and individual volatile acids, alkalinity, acidity, pH, nitrogen and phosphorus, chlorides, sulfides or sulfates, and pertinent heavy and alkaline earth metals.

Mass flux will be determined for the contaminant monitored and analyses made to interpret and control the stabilization process. Modifications to the basic systems operation will be made as required. The energy generation potential, methane production, will be assessed. Recommended design and control procedures for leachate containment and recycle will be developed. The solid waste of each cell will be sampled at the start and completion of the tests for visual and quantitative characterization.

A rigorous assessment of the cost/benefits of the recycle concept, in context of daily operation/implementation, including economic and technical feasibility, and the extent of potential application will be prepared during the first budget period. This is a 2-year project, with anticipated completion 6/30/77.

R803963

Metabolic fate and effects on drug metabolizing enzymes in liver will be investigated in subhuman primates following oral administration of several chlorinated hydrocarbons identified as possible contaminants in drinking water. The compounds will be labeled with ^{14}C and for each substance the profile of metabolites in urine and feces will be determined. Sufficient quantities of the metabolites will be isolated to permit quantitation and structural identification. In addition, the effects of subacute administration of these agents on drug-metabolizing enzymes and on the ultrastructural characteristics of the liver and other target tissues will be determined. Finally the relationship of dosage level on metabolite pattern and hepatic responses will be evaluated.

R803967

Objectives: To develop a simplified method for keeping fecal streptococci and coliforms in water samples in a viable, static condition under conditions of transport where variations in temperature could occur.

Procedures: 1. A combination of nutriments and antibiotics will be used for maintaining E. coli and S. faecalis in filtered waters.

2. The combination of nutriments and antibiotics will be used for maintaining indicator bacteria in polluted water samples and samples containing industrial wastes.

R803968

The objectives of this work are to study the occurrence and toxicity of various contaminants and groups of contaminants found in renovated wastewaters. They study will involve the use of mammalian cells (platelets, fibroblasts, and neutrophils) to study the toxicity of concentrates and various fractions of the concentrates when added to cell cultures in vitro. The testing of cytotoxicity of the concentrates will serve as primary toxicity screens; furthermore, by separating the concentrate into various chemical classes such as polynuclear aromatic hydrocarbons, chlorinated hydrocarbons, etc. the various chemical groups can be tested as groups for toxicity. Thus the cytotoxicity tests will serve as indicators of the most important chemical groups and compounds. The work will consist of the use of various techniques to concentrate contaminants in renovated wastewater. These concentrates will then be tested for toxicity to the cell cultures (both in terms of functional effects and effects on energy metabolism). The concnetrates will be further fractionated and tested again for toxicity. The cells to be used will be obtained from both animals and human volunteers.

R803969

The first large brackish water hyperbolic cooling tower installation will commence operation in May 1975 at the Potomac Electric Power Company Chalk Point Generating Station Unit 3 about 60 km southeast of Washington, D.C. The Marley tower is specified as meeting a state-of-the-art maximum drift rate of 0.002% of the circulating water flow rate at design conditions.

The overall objectives of the Chalk Point Cooling Tower Project are to fully characterize the effluent plume discharged to the atmosphere in order to enable scientists to assess environmental impacts of such hyperbolic cooling towers, both with regard to phenomena such as fogging, precipitation enhancement, and downwind icing, but also with regard to possible effects on vegetation and man-made structures by the deposition of salts originating in brackish or saline water drift.•

The First Major Objective of the AIRBORNE MONITORING STUDY is the characterization of the atmospheric emissions in the course of the plume trajectory from the cooling tower exit to that point downwind at which the plume is no longer evident, in order to study the distributions of (a) water vapor content, (b) temperature excess, (c) drift drop size distribution, (d) integrated drift liquid water content, and (e) plume dimensions, as they vary between the emitter and the receptor.

The Second Major Objective is to study interactions between the cooling tower water vapor plume and the fossil power plant stack gas plume, especially the potential for the formation, and the subsequent fate, of sulfuric acid mist.

The most recent concern pertains to the subject of aircraft safety, i.e., the hazard potential which may be associated with the inadvertent trajectory of an aircraft through the cooling tower plume, particularly should the aircraft be operating under emergency conditions. The Third Major Objective of this Study is to address this question in terms of turbulence, aircraft icing, and loss of visibility.

R803975

The objective of this work is to make a detailed chemical and biological evaluation of the aerated lagoon system presently operated by the Windber Area Water Authority of Windber, Pennsylvania. The three-cell Hinde Aqua Lagoon unit will be sampled at five points within the system. The samples will be collected at the (a) lagoon influent (b) between lagoon cells in series (c) lagoon effluent (Unchlorinated) and (d) after effluent chlorination. The samples will undergo extensive chemical analysis as well as fecal coliform counts and algae cell counts. Variables such as weather, wastewater temperature, daily flow entering and leaving the lagoon, and electrical requirement for operation of the plant will also be recorded. The study will be 12 months with one 30 day period in each season of continuous sampling. The results will be evaluated by EPA to aid in future lagoon design, etc.

803983

1. Objectives: To document the responses of a tropical estuary ecosystem (Kaneohe Bay, Hawaii) to the removal of sewage stress and then to arrive at adequate theoretical bases to predict those responses.

2: Approach: To sample components of the ecosystem at frequent time intervals both over a period preceding the sewage diversion and then afterwards; to simulate the change in sewage regime in tank microcosms, and to build mathematical models which describe the responses. To accomplish these goals, the program is divided into seven working groups: chemistry, phytoplankton, zooplankton, nekton, benthos, microcosms, coordination.

3. Current plans call for beginning the above programs as soon as possible in order to get adequate baseline data before the projected early 1977 sewage diversion and then to continue for at least one year (if necessary, longer) past the time of diversion.

803986

The objectives of this study are (1) to determine the quantity of enterovirus which must be ingested with drinking water to produce an infection, the "Oral Infectious Dose" (OID), and (2) to determine how many OID's must be ingested with drinking water to produce disease, the "Oral Pathogenic Dose" (OPD). Swine have been chosen as the best available representatives of man for such a study; they and their homologous enteroviruses comprise our model system. Early-weaned pigs (3-4 weeks old, 15-20 lb.) will be tested to determine that they are neither infected nor immune to the virus with which they are to be challenged. They will be housed in individual isolators and challenged with measured doses of virus in drinking water. Starting with one tissue culture dose per animal, challenge doses will be increased with each successive cycle of experimental animals until the OID and the OPD have been reached. Once experiments with one virus serotype have been completed, a second challenge virus will be used in a second series to confirm the initial findings.

R803988

Objectives. Study the effectiveness of controlling flow rate and of using lime and hydrous oxides of iron as disposal site liner materials for retarding the migration of the trace elements As, Be, Cd, Cu, Hg, Ni, Pb, Se, V, and Zn through soil.

Approach. Pass landfill leachate spiked with trace elements through columns of disturbed soils under anerobic conditions at controlled flow rates. Work will be segmented as follows:

a. Evaluate the influence of lime and iron hydrous oxide liners on the migration rate of selected trace elements.
b. Determine the influence of solution flux or flow rate on attenuation of selected trace elements by soil and by liner materials.
c. Modify an existing mathematical model to predict changes in quality of leachate as it percolates through liner materials.
d. Recommend procedures for field verification of the effectiveness of the liner techniques developed in this project.

Progress. Results from previous work (EPA Contract No. 68-03-0208) indicated that these procedures for modifying the soil environment at a disposal site were the most likely to be practical and effective in retarding the migration of trace elements in soil. Work on this project is just starting.

R-803992

The objective of the proposed work is to compile a single information source listing scientific and technical publications relating to oil pollution research and engineering, oil pollution related patents, and oil pollution studies sponsored by government, industry and private and public institutions. Also to be included will be summaries of oil spill events.

Scientific and technical information and patent descriptions will be obtained from the current literature including the abstracting journals. Information concerning current oil pollution studies will be obtained from the Smithsonian Science Information Exchange (SSIE) and oil spill events documentation will be obtained from the Environmental Protection Agency files.

Citations will be arranged by subject matter and submitted in report form quarterly to the Environmental Protection Agency.

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R803998

This program deals with the question whether asbestos exerts a carcinogenic or cocarcinogenic effect,with particular reference to the gastrointestinal tract. Studies are conducted in vitro on epithelial and fibroblast type of cell lines derived from various tissues, including the large bowel. These cell systems are exposed to asbestos fibers of various types alone and together with direct-acting carcinogens and procarcinogens which require metabolic activation. The aim is to see whether these various treatments and interactions result in transformation of the cell systems used. Evidence for transformation will be morphological, ultrastructural, biochemical, as well as independent growth in syngeneic animal systems. Further, the effect of asbestos on intracellular elements such as lysosomes will be assayed by microscopic, histochemical and biochemical techniques.

R804001

The purpose of this work is to determine the characteristics and nature of soluble organic nitrogen compounds which sometimes exceed the proposed effluent standards for total nitrogen. The impact of these compounds on the receiving water to include algal growth stimulation will be evaluated. Various chemical and physical processes for removal of soluble organic nitrogen will be investigated including chemical precipitation, oxidation using several oxidants, and adsorption. Cost effective analysis will be made on the most promising process.

R 804003

The objective of this project is to combine the techniques of electron microscopy ultracentrifugation, serology and tissue culture to identify, isolate, characterize and propagate the etiologic agent of infectious hepatitis, and to develop a sensitive in vitro diagnostic for its detection.

Several hundred fecal and several thousand serum samples have been collected from a carefully monitored population during an epidemic of infectious hepatitis at the Lynchburg (Va.) Training School and Hospital. These samples were taken at preinfection, acute and convalescent stages and thus provide both experimental and control material. Using convalescent sera as the antibody source, we have thus far shown a close morphological and serological relationship between a 27 nm particle found in the Lynchburg fecal samples and a similar particle found in the Joliet, Phoenix and San Diego hepatitis outbreaks.

Attempts are being made to grow the agent in vitro and to develop a sensitive assay system.

R804019

The objective of the project is the examination of biological sludge dewatering alternatives. Seven pilot plants will be installed at a pulp and paper mill site where an activated sludge plant exists. These seven pilot plants will include centrifuges, ultrafiltration concentration device, plate and frame filter press, moving belt presses and a capillary suction dewatering device. Operating and performance data will be generated which will provide a basis for a comparison of sludge dewatering options that have the potential to meet the various disposal requirements at a given site.

The findings of the study will be beneficial to those involved in secondary sludge disposal programs directed toward (a) reducing the quantity of waste solids requiring disposal and (b) identifying the options available.

R804033 02

The objective is to initiate measurements on both the vertical and horizontal concentration distributions of halocarbons in the troposphere and lower stratosphere which are present or suspected to be present in the atmosphere. Determination of the concentrations of the halocarbon species and their reaction products will be accomplished by the methods of electron capture-gas chromatography and gas chromatography-mass spectrometry. Samples will be collected by aircraft flights and at selected ground stations in the United States.

R-804034

This research involves a study of the theoretical and practical aspects of fine grinding of refuse. Current information on refuse size reduction primarily concerns larger particle sizes. This research will extend that data to smaller particle size ranges. Experiments will also be conducted to compare various grinders with respect to their capabilities for producing fine particles of refuse.

R 804086

The objective of the proposed work is the development of a management strategy for dealing with variations in internal process control losses which involves (a) the characterization of raw waste variability from selected sources at a number of mills, (b) the selection of suitable process loss detection instrumentation, (c) assembly of computational programs and computer hardware for conduct of a field demonstration of the application of this management strategy and (d) installation of the equipment and conduct of the field demonstration as a means of assessing the effectiveness of the management strategy.

The proposed project is of interest to those in the pulp and paper industry attempting to manage intermittent process control losses through a system of alternatives such as collection with return to process or tailored discharge to a treatment plant.

R 804123

Catalytic hydrodesulfurization (HDS) and hydrodenitrogenation (HDN) reactions for the removal of organic sulfur and nitrogen compounds from liquid fuels are becoming increasingly important as strict sulfur and nitrogen oxide emission standards are set, and "dirtier" oils derived from shale and coal attain wider use.

A quantitative description of the interferences between these two reactions, which have only recently begun to be studied, is necessary for optimal design of commercial processing units. To date, we have studied thiophene and pyridine as representative sulfur and nitrogen compounds in a continuous-flow microreactor to model basic interactions. Pyridine inhibits thiophene HDS under all experimental conditions used. Sulfur compounds exhibit a dual effect on the HDN of pyridine; a reaction rate inhibition gives way to an enhancement at more severe reaction conditions. Theoretical considerations have been presented to account for each of these effects. Reactions of more complex compounds and their interactive reaction kinetics are currently under investigation.

R 804127

Evaluations of numerical classification being conducted under an existing EPA grant (R 803599-01-0) will continue and considerations will be expanded to various forms of ordination and other multivariate analyses, for which synthetic descriptions and evaluations will be similarly provided.

All of these techniques will be compared and assessed on the basis of applications reported in the literature, tests on model and actual data from environmental impact studies, and analysis of a wide variety of data on estuarine communities in the Chesapeake Bay. Efficacy will be weighed together with theoretical and practical considerations.

Multivariate analyses will be applied to collection data generated by an investigation of the impact of a refinery and power plant complex on estuarine benthic communities.

R 804147

(1) Objectives: to provide guidelines for use by the Environmental Protection Agency and others in specifying sampling and processing requirements for marine plankton surveys and monitoring programs.

(2) Approach: through literature surveys and personal interviews with current plankton researchers, two sets of guidelines will be developed, one each for phytoplankton and zooplankton. This will include techniques for sampling, sample processing, identification and data analysis, in detail sufficient for use by those responsible for specifying sampling requirements in coastal and oceanic waters.

804150

This Research Grant involves the study of the technical and economic aspects of preparing and using densified forms of municipal solid waste as a supplementary fuel in industrial and institutional stoker coal fired boilers. Investigations will be conducted to establish methodology for preparing densified refuse derived fuel (d-RDF). Process and product characterizations will be developed to enable establishment of specifications for d-RDF. Densification forms will include pellets, briquettes, and cubettes. Independent boiler burn tests and operations will be conducted in conjunction with this research to fully characterize the concept.

R804155

The goal of this proposal is to explore the use of coherent anti-Stokes resonance Raman spectroscopy as the basis for a detection system for liquid chromatography. Relatively non-volatile organic compounds encountered in the various phases of coal utilization and in the pesticide-insecticide area should be detectable at very low concentrations. This detector will not only be sensitive but will also provide structural information about the various components. Particular emphasis will be placed on the development of optical cells designed to optimize detection sensitivity. Since solvent interference will be a crucial factor, research on new or modified chromatographic procedures will be necessary. Our final goal is to carry out under computer control an entire chromatographic analysis of different types of real samples.

R804161

The basic objectives of the proposed study are: 1) to determine the minimum human oral infective dose of Sabin type 1 poliovirus strain in infants, 2) define the age specific rate of acquisition of antibodies to a number of important enteroviruses in young children with similar socioeconomic backgrounds who have different drinking water sources, 3) determine by serologic testing the incidence of enterovirus infections in children who participate in swimming classes at urban beaches and pools and compare to a control group engaged in non-swimming team sports, and 4) determine the frequency of recent exposure to recreational waters by children seeking medical attention with confirmed enteroviral illness and compare to a control group being seen for non-infectious problems. Data obtained from this study will indicate whether: 1) infants can be experimentally infected with very low oral doses of enterovirus, 2) children with similar socioeconomic backgrounds who are exposed to different types of drinking and recreational water sources acquire enterovirus infections at different rates, 3) children who swim frequently at beaches or pools acquire more infections than children who participate in non-swimming team sports and 4) children with enteroviral illnesses have recently had greater frequency of swimming than children who did not acquire enteroviral illness during this time.

R804162

The objective is to develop a method of predicting potential ground-water degradation in strip coal mining on the basis of the mineralogy of the overburden. The mineralogy of overburden core samples will be determined and compared with the mineralogy of similar material that has undergone extensive chemical weathering in old spoil piles. The ground-water degradation that has resulted from leaching through the old spoils will also be determined qualitatively and quantitatively. This field-oriented, cause-and-effect approach will help to establish the relationship between the mineralogy of overburden and potential ground-water degradation.

R804175

Supersaturation of air in natural waters either by hydroelectric plants or thermal effluents is becoming an increasing environmental problem and has already accounted for large mortalities of anandromous fish in the northwestern United States. Increasing development of hydroelectric and/or nuclear plants as a result of increased energy needs can be expected to increase this problem, definition of which requires less specialized, easily available analytical techniques.

The methods currently available for measuring and/or monitoring total dissolved gas pressure in liquids, while accurate and reliable, are expensive, require specialists for operation, and are not suitable for continuous unattended monitoring.

The objective of the project is the design and development of simple, inexpensive instrumentation using the existing principle of a diffusion membrane and electronic pressure transducer to measure and record total dissolved gas pressures. Alternatives for membrane materials, configurations and mechanical interfaces and signal analysis will be explored, constructed and field tested.

R804179

The general objective is to employ the transport, enrichment, and exclusion capabilities of ion exchange membranes as new tools in water analysis. There are two specific objectives.

1.) A cation exchange membrane envelope for sampling and enrichment of trace cations in a water sample will be designed, constructed, and studied. In principle, for water samples of low or moderate ionic strengths, enrichments of two orders of magnitude should be achievable by transport of the trace cations from the water sample through the membrane into a small volume of an acceptor solution of controlled composition. The acceptor solution would then be used for measurement of the trace ion concentrations, at higher levels, and more easily than the original water sample.

2.) A copper ion-selective electrode will be covered with a cation exchange membrane, trapping a small volume of an acceptor solution of controlled composition in between. Upon immersion in a water sample, any trace Cu(II) in the water sample should be enriched in the acceptor solution, to levels that can be more easily measured by the copper ion-selective electrode.

The enrichment factors for both of these devices are in principle independent of the properties of the membrane and of all of the properties of the trace cation except the charge. With proper design, these devices should operate in the nanomolar concentration region (down to about 0.1 ppb), and they should be capable of on-site use.

804182

Objectives - Determine the technical, economic, financial and managerial/administrative feasibility of a joint regional industrial waste treatment facility in a highly industrialized area (chiefly steel).

Approach - Locate and characterize waste waters and related manufacturing processes; analyze waste water transport; analyze integration of compatible wastes (eg., caustic plus acid for neutralization); analyze waste-water and resource (waste constituent) recycle and recovery, including waste treatment. Conduct engineering, economic, financial and management/institutional analysis.

Current Plans/Progress - Study will be integrated with on-going comprehensive water quality management plan in area, and with an upcoming residue (solid waste) management plan in Allegheny County. Specific site sampling will supplement "paper" data already collected, and study will complement joint municipal - industrial treatment feasibility studies.

R-804183

The primary objective of the proposed research is to develop a systems approach that through tracing and decomposition will identify the socio-economic potentials for energy conservation by reduced municipal waste generation.

A two year study is planned in three phases: Phase I--Development of a macro model using refuse data, handling procedures and costs from the USA and Europe; Phase II--development of a micro model using a decomposition technique that "looks at" the component parts of refuse by kind, by composition, by source, etc., to identify good candidates for possible use reduction and to evaluate the use reduction in terms of energy conserved.; the third Phase will be a heuristic study of high make candidates for energy conservation involving social/economic/life style alteration.

Based upon published data and ongoing work at the University of Oklahoma, in effect, the study is primarily one of pulling together all of the various components into a system that through tracing and decomposition will identify the socio-economic potentials for energy conservation through reduced municipal waste generation.

804195

I. Objectives. The objective of this grant is to provide the funds requested in the grant proposal to sponsor a national technical conference which will focus on the complete reuse of industrial wastewater. In developing the agenda for the conference, emphasis will be placed on identifying pollution control applications where use is made of the by products of the control systems.

R-804200

I propose to study the effect environmental contaminants--particularly at subclinical doses--will have on cell-mediated immunity and to explore possible mechanisms of alteration by observation of characteristics of macrophages and lymphocytes. Several different cell-mediated tests will be utilized and subclinical doses of the contaminants will be administered. Lead will be examined initially, but the effect of other heavy metals and insecticides will be measured should lead alter the immune response in mice.

Lead acetate will be administered in the drinking water of mice for prolonged periods so there will be a gradual accumulation simulating natural conditions. Kidneys will be analyzed for content of lead to determine actual concentration and histopathology will determine alterations that may occur from exposure. We will endeavor to ascertain the effect lead, etc., has on: migration of macrophages via direct or indirect sensitization of mice with Bacillus Calmette-Guerin (BCG); possible decrease of phagocytosis of macrophages via measurement using opsonized sheep red blood cells (SRBC); possible suppression of T lymphocyte activity by injecting footpads and measuring CMI; possible suppression of T cell helper function in humoral antibody response and measure the effect of macrophage helper function.

If low levels of environmental contaminants render the host more susceptible to cell-mediated immunity, then permissible levels of these compounds for humans should be re-examined.

R-804202

The objectives are:

1. Conduct a comparative survey of organic residues of drinking water using both bacterial and tissue culture systems for in vitro detection of active mutagens and carcinogens.

2. Analyze pathways of metabolite activation in rats for mutagenesis/carcinogenesis using the 2 in vitro detector systems.

3. Study the modes of action of certain carcinogens and carcinogen metabolites in bacterial DNA metabolism and in the mechanism for transformation of tissue culture cells.

Systems to be applied are a set of 5 tester strains of *Salmonella typhimurium*, and low spontaneously-transforming clones of the 3T3 line of mouse embryo fibroblasts. Rat liver microsomal fractions will be employed for in vitro metabolic activation of test substances. A set of 5 previously identified organic constituents of drinking water will be examined for metabolic activation using rats. The compounds will tested as toxic substances per se, as precursors capable of metabolic conversion to more toxic, mutagenic, or carcinogenic metabolites, and as inducers of hepatic mixed function oxidase enzymes.

R804206

This project was initiated to determine whether waterfowl pose a human health hazard or potentially threaten safe recreational use of waterways.

Waterfowl will be investigated for presence of potentially pathogenic organisms. Surface water and sediment will be sampled for same at sites of heavy waterfowl concentrations. Pathogens or useful indicator organisms will be characterized extensively. Waterfowl concentrations and immigrations will be monitored in the specific areas selected for study.

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R804207

This project was initiated to determine whether waterfowl pose a human health hazard or potentially threaten safe recreational use of waterways.

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804215

A surveillance of four collectives of pollutants in U.S. coastal waters will be sought through their concentrations in two sentinel organisms -- mussels and barnacles. The pollutant species include heavy metals (lead, cadmium, mercury, selenium, zinc, silver and copper), chlorinated hydrocarbons (DDT residues, polychlorinated biphenyls, hexachlorbenzene, dieldrin, endrin, heptachlor, benzene hexachloride, cis and trans chlordane and the insecticidal derivatives oxychlordane and heptachlor epoxide); artificial radionuclides (plutonium-238, plutonium 239+240, americium-241 and cesium-137); and petroleum hydrocarbons (to include measures of the concentrations of alkanes, cycloalkanes and aromatics, including 2, 3, 4, and 5 ring polynuclear condensed species).

The program will include sites off the east, west and Gulf coasts of the U.S. as well as off Alaska, Guam and Samoa. One hundred samples will be taken during the first year of the project and analyzed in 8 laboratories, two for each set of pollutants.

The goals of the program will be the assessment of the U.S. coastal waters for the support of marine resources such as food from the sea, the vitality of communities of marine organisms and the continued use of non-living resources such as beaches and harbors and the prediction of future exposure levels of pollutants based upon the best existing information and models.

804216

It is proposed that the Environmental Protection Agency develope an environmental impact program for a representative estuarine site in Narragansett Bay, Rhode Island. These studies would be aimed at selecting and monitoring representative important species. Inherent variability and biases of any gear used will be determined, specifically as relates to the problem of avoidance. Preliminary studies of small scale temporal and spatial variability will be conducted before establishing ongoing monitoring programs. The study proposed here will serve as the first phase of the much longer duration program implied above. This study is aimed primarily at understanding the biases and variability inherent in ichthyoplankton sampling. presently accepted standard ichthyoplankton gear will be used to the greatest extent possible to permit comparisons with past and ongoing studies.

804218

The objective of this study is to critically evaluate the newly proposed tentative Standard Methods procedures for concentrating and detecting enteric viruses in large volumes of drinking water and other finished waters. The evaluation of the procedures will be done with a total of six different viruses representing the four major enteric virus groups. These viruses are: poliovirus type 1, bovine enterovirus type 1, reovirus type 1, adenovirus type 1, simian virus 11 and Minute Virus of Mice. In a later phase of the evaluation, mixtures of naturally occurring enteric viruses obtained from wastewater will also be utilized. The four different types of microporous filters that are currently recommended as virus adsorbents will be evaluated using 100 gallon volumes of tapwater experimentally contaminated with low levels of the six test viruses. All aspects of the tentative Standard Methods procedure will be investigated, including primary virus adsorption, primary virus elution and reconcentration. If the presently recommended tentative Standard Methods procedures for concentrating and detecting enteric viruses in finished waters are found to be incapable of efficiently recovering certain enteric viruses, then modifications of the methodology will be investigated and evaluated.

S-804220

Processed cucumber pickles are produced by natural fermentations, brined at 45°-65° salometer, then desalted for packing. Large quantities of high chloride wastewaters are produced in the brining and desalting. The US Food Fermentation Laboratory has developed a controlled culture fermentation (CCF) process in which cucumbers are washed, inoculated with the desired cultures, brined at 25°-30° salometer, and briefly rinsed before packing. This process was developed to improve product quality by eliminating the undesirable microorganisms which sometimes interfere in natural fermentations.

The overall objective of this project is to demonstrate on a commercial scale the reduction in quantity and loading of wastewaters from the CCF process, as compared with those from natural fermentations. The project will be conducted at a commercial pickle plant.

The specific objectives are as follows

A. to demonstrate on a commercial scale substantial reduction in salt and water usage in brining and processing cucumbers by substitution of the controlled fermentation procedure (approx. 25° salometer brining) for the current natural fermentation procedure (50-65°).
B. To compare product quantity and quality of pickles made from brinestock produced by controlled fermentation with those produced in the conventional natural fermentation procedure.
C. To compare waste streams (volume, oxygen demand, organic carbon, solids, chlorides, N and P forms) under conventional and demonstration conditions.

S804221

The proposed project consists of the design, preparation of plans and specifications, construction, and operation of a 30 mgd water treatment facility for Duluth, Minnesota, for the removal of asbestiform fibers and turbidity from the water of Lake Superior. The proposed design unit processes would incorporate the findings of a six month pilot plant study conducted by the USEPA in 1974 that demonstrated the successful removal of asbestiform fibers through granular filtration. Operation of the full-scale facility through a complete cycle of seasonal conditions should increase the data base of asbestiform fiber removal state of the art and facilitate adaptation of similar unit processes at other locations. Several areas of investigation during operation of the full-scale facility are proposed to provide on-going research benefits. Mixing efficiencies and power consumption in the coagulation and flocculation facilities would be examined. Points of application and dosage rates of the chemical feed systems would be varied. A coagulation control center would provide immediate feedback as to the efficiency of chemical additions and a research pilot plant located in situ would provide greater flexibility in long range full-scale plant adjustments. Depths and gradations in filter media in one full-scale filter bed would be varied and both dual and tri-media configurations would be tested. Chemical feed and mixing apparatus in the wash water recovery system would be adjusted to obtain the maximum concentration of sludge. Management of the sludge lagoons would be varied to accommodate sludge application and removal in both a liquid and a solid (frozen) mode. Electron microscope monitoring for asbestiform fiber concentrations in all phases of treatment would be conducted for a period of one year and monitoring for asbestiform fiber contamination in ambient air and ground water sources would be conducted.

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R-804226

The objective of this project is to expedite the work of approximately 40 systematic specialists in the preparation of manuals for the "Marine Flora and Fauna of the Northeastern United States" byproviding funds over a two year period for (a) preparation of illustrations, clerical supplies and assistance, (b) collection of specimens, collecting and processing materials, (c) consultation with specialists and research collections in major museums and other institutions. The "Marine Flora and Fauna" has as its goal the preparation and publication, in collaboration with systematic specialists in the United States and abroad, original, illustrated, modern manuals on the identification, classification, and general biology of estuarine and coastal marine plants and animals of the northeastern United States. Manuals are published and distributed by the National Marine Fisheries Service in the NOAA Technical Report NMFS Circ series. Six manuals have been published; additional ones are in preparation, being revised, or in press. Eighty one systematists are working on manuals, and more specialists are being recruited. Requirements for accurate identifications of biota will not only continue, but will increase, because of the escalating concern of many agencies and the public with issues of environmental quality.

R-804259

The objectives of this project are to (a) measure denitrification in a field soil directly from the fluxes of N_2 and N_2O at the soil surface, (b) compare denitrification obtained from N_2 and N_2O gas fluxes with denitrification obtained by difference, and (c) measure the amount of denitrification from an applied inorganic fertilizer source as affected by an actively growing crop or manure amendment, water content, and temperature of a field soil. Denitrification will be determined directly from field-measured gas concentration gradients and diffusion coefficients of N_2 and N_2O gases evolved from nitrate fertilizer labeled with ^{15}N. Soil, grass, and leachate samples will be analyzed to determine the amount of N immobilization in soil, plant uptake, and leaching loss in order to calculate denitrification by difference. The results of this research will be used to evaluate the feasibility and accuracy of using a direct determination of denitrification and will give results on the amount and dynamics of denitrification under field conditions.

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R-804265

An international conference will be held under the auspices of the Subcommission on Salt-Affected Soils of the International Society of Soil Science. The conference will be hosted by Texas Tech University and co-sponsored by New Mexico State University, Texas A&M University, the U.S. Salinity Laboratory, and the U.S. Environmental Protection Agency. There will be five days of paper presentations and workshops (August 16-20, 1976) and a four-day field trip through West Texas and southern New Mexico (August 21-24, 1976).

The objectives of the conference are(1) to exchange results of research on field use of saline waters for irrigation,(2) to compare prediction models for salinity control in irrigation return flows,(3) to exchange data on field testing of prediction models,(4) to obtain agreement on standardization of analytical methods for soil salinity tests, and (5) to encourage national and international cooperation in resolving salinity problems.

R8 04283

I. The major objective will be to determine the upper concentration limits (in freshwater) of four toxicants that will not adversely affect downstream migration and seawater adaptation of juvenile coho salmon (Oncorhynchus kisutch). The toxicants (to be studied independently) are: Metals - cadmium, chromium; Herbicides - a picloram herbicide, a phenoxyherbicide.

II. A second objective will be to use the data (from Objective I) to evaluate and continue refining a standard method currently being developed (EPA Research Grant R-802468) for measuring the effects of pollutants on the ability of juvenile anadromous salmonids to (1) undertake their normal downstream migration and (2) adapt to seawater.

Procedures:

1. Juvenile coho that have been subjected to chronic metal and herbicide intoxication prior to and during smolting shall be challenged by immediate transition to seawater and the mortalities recorded. Groups of fish will be sacrificed for blood (0 to 240 hours) after initiation of seawater exposure to determine osmotic and ionic regulatory ability. Levels of sodium and potassium-activated gill ATPase will be measured. Groups of juvenile coho will be released into a stream during the normal migratory period, number and rate of fish movement will be recorded.

2. Previous experience and research has established appropriate methods for evaluating the ability of Pacific salmon to adapt to seawater. Effort will be devoted to evaluation and refinement of a standard method for measuring the effects of pollutants on juvenile salmonid's ability to migrate and adapt to seawater.

R804286

The objective of this project is to evaluate the safety for human consumption of poultry slaughtered and processed with an average 50 percent mixture of treated well-water and reclaimed wastewater from the same plant. The wastewater reclamation system has been constructed and a preliminary study has indicated that the renovated water is capable of meeting the 1962 P.H.S. Drinking Water Standards. The purpose of this project is to evaluate with actual recycle the safety of the renovated water and the processed poultry, both in terms of the new E.P.A. primary drinking water regulations, as well as any other chemical and microbiological contaminants likely to be present and have an adverse effect on human health.

After the renovation system has been optimized (Phase 1), a two-month study (Phase 2)will be instituted, without actual return of water to the treatment plant following which an evaluation will be made with representatives of the Department of Agriculture and the E.P.A. as to the quality of the renovated water and the contaminants in the carcasses processed with well water and renovated water. If the evaluation indicates that there is no danger to human health, Phase 3 will be instituted in which for a three month period there will recycle of the renovated water through the processing plant. The water and processed poultry will be studied as in Phase 2. Following the termination of Phase 3, an evaluation will be made of the health implications of continuing processing the poultry with the mixture of treated wastewater and well-water, as well as the need for monitoring to insure the safety of the system and the protection of human health.

R804290

The proposed research will investigate the effects of 2,4-dinitrotoluene, 2,3,7,8-tetrachlorodibenzo-p-dioxin, and hexachlorobenzene of the adult male albino rat. Potential antifertility effects, and the reversibility of these effects, will be determined by twelve week feeding studies with subsequent mating and by daily oral intubation with serial mating. The mutagenic potential will be assessed by the classical rat dominant lethal assay. To determine the mode of action of these agents, the integrity of the pituitary-gonadal endocrine system will be assessed by monitoring LH, FSH, and testosterone levels at weekly intervals during chronic oral administration. In addition, the ability of these agents to penetrate the blood-testicular barrier (BTB) will be assessed by rete testis cannulation and efferent duct ligation experiments. The mechanism of penetration will be determined in vitro (i.e. active or passive). If these agents traverse the BTB, their effects on DNA, RNA, and protein synthesis in the developing spermatogenic cells will be determined. These data will provide a basis for the establishment of a safe intake level using reproductive performance as a sensitive index of safety.

1. Principal objective--to quantify the presence of nematodes in various units of a water treatment facility by providing answers to these specific questions: (a) Where are the larvae, adults, and gravid nematodes located and what are their densities: (b) Are there correlations between densities and a physical, chemical, or biological environmental factor which may suggest a cause-effect relationship in the presence and growth of these animals: Subordinate objective--to evaluate scanning electron microscopy (SEM) as a means of quantifying the presence of free living nematodes in water.

2. Approach: The plan for this project can be divided into three divisions; the first two are preparatory to the third. (a) The scientific validity of our study will rest largely on the knowledge of what species of nematodes are in the water supply. (b) It is very probable that the scanning electron microscope (SEM) will be used for quantification of nematodes in water. From preliminary observations this method seems to hold promise, but a reliable protocol for the careful preparation of a sample is necessary. (c) The heart of the study will consist of: (1) taking samples from numerous locations throughout the Greenwood Water Treatment Facility, (2) determining the nematode's stages of development and densities and (3) evaluating the data to provide some understanding of the animal's breeding characteristics. We also hope to determine if the population size is dependent upon, or correlated with, an environmental parameter such as a change in nutrients, pH, or mineral content of the water source or the frequency of back-washing the sand filters.

804 303 01

This project is designed to develop the necessary modifications and changes in interpretations of western water laws that will facilitate the implementation of improved water management technologies thereby reducing and controlling salinity and other forms of water pollution resulting from the exercise of irrigation water rights. To accomplish this goal, four major objectives will be satisfied:

1) Describe and define the legal aspects of water quality control programs relevant to irrigated agriculture for the seventeen western states to include: (a) statutes: (b) regulations; and (c) implementing machinery.

2) Describe the degree of interface of the law between: (a) water quantity allocation and management; and (b) water quality control.

3) Relate the characteristics of the physical irrigation system (which consists of three subsystems - water delivery, farm and water removal) and appropriate technological solutions for achieving irrigation return flow quality control to the legal system (which consists of both legal parameters - water quantity and water quality) for each of the seventeen western states.

4) Prepare modification or enactments for either or both parameters of the legal system in order to achieve irrigation return flow quality control.

The analytical approach, after collection and assimilating material on western states water quality laws and programs (the material on state water quantity laws is already available), is first to describe in general the legal system (both water quantity, and water quality) in each state, and second, to structure the legal system of each state at the three sublevels of an irrigation system.

804 308

Objectives: The principal objectives of the 2nd National Conference on Individual Onsite Wastewater Systems are to evaluate the state-of-the-art of individual onsite wastewater systems including wastewater recycle and water conservation systems, examine governmental arrangements for their regulation, and to develop recommendations for uniform standards and practical methods for their implementation.

Approach: Using a conference type setting, bring together speakers who can communicate the experiences of their field activities or research projects, provide an opportunity for manufacturers to exhibit their equipment, and publish the complete proceedings of the conference to enable wider dissemination of this scientific information.

Current Plans or Progress: Arrangements are set to hold the conference on November 5, 6, and 7, 1975 at the Marriott Inn, Ann Arbor, Michigan. A planning committee has met for the purpose of defining the program, and selecting speakers. Facilities and most speakers are committed.

804 318 01

The proposed research will determine if various pesticides (Kepone, parathion, phosphamidon, carbaryl/carbofuran and 3,4-D) are present in the saliva of rats and humans. Investigations will determine if a relationship exists between the levels in blood, saliva and urine, and if the levels in saliva are indicative of exposure. Alterations in blood cholinesterase activity as reflected by salivary cholinesterase levels will be studied. The mechanism of movement (i.e. active or passive) of pesticides across the salivary membrane and the biotransforming capabilities of salivary tissue will be assessed by in vivo and in vitro techniques. The subcellular localization and any involvement leading to molecular pathology will be determined. Simple and reliable semiquantitative tests for the presence of pesticides in saliva will be developed.

804328

(1) The main objective is to determine the effects of chlorinated and brominated hydrocarbons on the metabolism of foreign organic compounds. An additional objective is to study their influence on porphyrin synthesis.

(2) Rats will be dosed.daily for prolonged periods with several concentrations of a number of benzene derivatives containing varying degrees of chlorination and bromination, and the effect of such treatment on parameters of drug metabolism will be assessed. Recovery will be monitored by imposing a recovery period between the cessation of treatment and the measurement of effects.

(3) The time periods of interest range from 14 to 120 days. The parameters of xenobiotic metabolism include EPN detoxification, benzpyrene hydroxylase, azoreductase, glucuronyltransferase and elements of the microsomal drug metabolizing system. In the porphyrin synthesis studies, total porphyrin and porphyrin precurser content of the liver and urine will be monitored.

R804330

The proposed research symposium on hazardous waste management on land, plans to promote contact between research personnel from various parts of this and other countries in an atmosphere conducive to free and unrestrained discussion, to interchange, interrelate, and circulate new information being generated in the field of solid hazardous constituents through diverse soils and produce a report of the proceedings that will contain a coverage of the most up-to-date knowledge on solid hazardous waste residual management by land disposal.

804 360

(1) Objectives: To provide professional and technical assistance; to disseminate information on all aspects of solid waste management; to provide timely input to EPA on programs, regulations, guidelines, and legistlation; to facilitate the sharing of information on solid waste management between cities; to provide information to EPA on successful solid waste practices and the degree to which they exist.

(2) Approach: (a) Three group technical assistance working sessions will be held; (b) ICMA will publish three issues of Refuse Report a newsletter of the latest happenings in solid waste management; (c) four technical asssistance transfer team visits will occur responding to cities with specialized needs; (d) a special index on solid waste practices and resources will be developed; (e) ICMA's solid waste clearinghouse will be further developed and expanded.

804 364

Since 1972, the American Petroleum Institute has conducted an extensive research program regarding refinery sour water stripping. New NH_3-H_2S-H_2O vapor-liquid equilibrium data have been obtained by Brigham Young University These data expand the temperature and concentration limits of available data. In addition, improved equations have been developed for equilibrium calculations.

Unfortunately, measurements on actual refinery samples showed that theoretical calculations are many times incorrect, if certain ammonia "fixation" components such as organic acids and amides are present. In these cases, caustic injection is required to release ammonia from solution.

Current work on the project is primarily oriented toward identifying "fixation" components and various forms of cyanides. These data will be used in future years to develop new vapor-liquid equilibrium correlations for a multi-component system including the "Fixation" components. Sour water samples from several refineries will be subjected to detailed analyses for both specific hydrocarbons and inorganic materials. Bench-scale stripping tests will be conducted to determine the best point(s) for caustic injection and the optimum bottoms pH. Similar tests will be run to develop empirical curves regarding the removal of cyanide containing compounds.

In addition, the new equilibrium equations proposed by Brigham Young University will be "fine tuned" and an option added for external pH adjustment. This will include revision of the existing computer program.

SECTION III
RESEARCH AND DEMONSTRATION GRANTS
SUB PROGRAM AREAS

Health Effects
Ecological Processes and Effects
Transport and Fate of Pollutants
Mineral, Processing, and Manufacturing
Renewable Resources
Waste Management
Water Supply
Environmental Management
Measurement Techniques and Equipment Development
Quality Assurance
Technical Support
Health and Ecological Effects/Energy
Extraction and Processing Technology/Energy
Conservation, Utilization and Technology Assessments/Energy

The following listings of research and demonstration projects have been arranged by subprograms.

The main thrust of the project determines the subprogram under which it is listed; the identification in the listing "(2)" or "(3)" means the project has a definite multiple objective and it is the second or third objective which causes it to be listed in that subprogram.

The main purpose of listing all awards by subprograms is to provide the staff of the Grants Administration Division a means of rapidly identifying projects awarded in a specific technical area. We hope that it will also be of value to the general public and make a more useful publication.

HEALTH EFFECTS SUBPROGRAM

800 637
801 379
802 030
802 207
802 370
802 759
802 794
802 890(2)
802 914
802 928
803 095
803 201
803 254
803 291(2)
803 299
803 395
803 423
803 510
803 520(2)
803 704(2)
803 798
803 872
803 963
803 967
803 968
803 998
804 003
804 161
804 200
804 202
804 218
804 221(2)
804 283(2)
804 286
804 290
804 292(2)
804 318
804 328(2)

ECOLOGICAL PROCESSES AND EFFECTS SUBPROGRAM

800 170
800 670
800 881
801 112
801 936
802 309
802 388
802 780
802 871(2)
802 914
802 974
803 009
803 072
803 104(2)
803 141
803 154
803 291(2)
803 370
803 395(2)
803 423(2)
803 458
803 754(2)
803 833
803 835
803 856
803 902
803 983
804 001
804 147(2)
804 215(2)
804 216
804 226
804 259(2)
804 283

TRANSPORT AND FATE OF POLLUTANTS SUBPROGRAM

800 397
800 398
800 649
800 874
800 916
801 136
801 301
801 132
802 160
802 815
802 890
802 913
803 514
803 516
803 704
803 827(3)
803 835(2)
803 851
803 887
803 896
803 989
804 033(2)
804 330(2)

MINERALS, PROCESSING AND MANUFACTURING SUBPROGRAM

800 773
803 415
803 525
804 086

RENEWABLE RESOURCES SUBPROGRAM

800 426
801 454(2)
802 985
803 524
800 525(2)
803 863
803 968(3)
804 195
804 220
804 265
804 286(2)
804 303
804 364(2)

WASTE MANAGEMENT SUBPROGRAM

802 292   802 309(2)   802 719   802 874
802 905   802 955   803 212   803 315
803 505   803 652   803 758   803 900
803 901   803 903   803 924   803 929
803 953   803 975   803 988   803 019
804 182   804 183   804 308   804 330
804 360

WATER SUPPLY SUBPROGRAM

800 637(2)   803 889   803 963(2)   803 968(2)
803 986   803 998   804 161(2)   804 202(2)
804 218   804 221   804 292   804 303(2)
804 328(2)

ENVIRONMENTAL MANAGEMENT SUBPROGRAM

801 112(2)   801 454   802 928(2)   803 291(3)
803 315(2)   803 596   803 827   804 001(2)
804 127   804 182(8)   804 206   804 207

MEASUREMENT TECHNIQUES AND EQUIPMENT DEVELOPMENT SUBPROGRAM

800 042
800 665
800 708
800 771
802 596
802 755
802 871
803 078
803 104
803 389
803 399
803 403
803 592
803 754
803 834
804 033
804147
804 155
804 179
804 215
804 259

QUALITY ASSURANCE SUBPROGRAM

802 235

TECHNICAL SUPPORT SUBPROGRAM

HEALTH AND ECOLOGICAL EFFECTS SUBPROGRAM

802 596(2)
803 063
803 215
803 415
803 992
804 162

EXTRACTION AND PROCESSING TECHNOLOGY SUBPROGRAM

802 681 804 364

CONSERVATION, UTILIZATION AND TECHNOLOGY ASSESSMENTS SUBPROGRAM

803 520 803 710 803 757 803 782

803 839 803 858 803 881 803 901

803 903 803 924 803 969 804 034

804 123 804 150 804 175 804 183